DOCUMENT RESUME

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TITLE	Women in Education for Apprenticeship and Non-Traditional Employment. Final Performance Report.
INSTITUTION	Portland Community Coll., Oreg.
SPONS AGENCY	Office of Vocational and Adult Education (ED), Washington, DC.
PUB DATE	91
CONTRACT	V199A90118
NOTE	244p.; Brochure, poster, and training videotapes are not included in this document. Photographs and newspaper clippings may not reproduce well.
PUB TYPE	Reports - Descriptive (141) -- Guides - Classroom Use - Teaching Guides (For Teacher) (052)
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IDENTIFIERS	*Oregon; Partnerships in Education; Portland Community College OR

ABSTRACT

This report describes a partnership between Portland Community College (Oregon), private industry, and public agencies to develop and implement a comprehensive program to recruit, train, and place women in apprenticeship and other nontraditional employment in the building trades. The Building Futures in Industry and Trades (B-FIT) program's final performance report, budget statement, and third-party evaluation are included in this package. These sections briefly describe the high graduation and employment rates of initial participants in the program. The majority of the document is an appendix containing the following project information: (1) course description; (2) industrial skills training course outline; (3) training objectives; (4) 13 B-FIT course content guides; (5) sample class schedule; (6) student orientation/screening procedures; (7) news articles; (8) job placement status report; and (9) advisory committee. The 13 B-FIT courses outlined in this document are: (1) applied construction I; (2) electrical/mechanical trades I; (3) basic trade builders math; (4) orientation to vocational training for skilled trades and industry; (5) targeting occupations in skilled trades and industry; (6) health and fitness for industry I; (7) applied construction II; (8) electrical/mechanical trades II; (9) contemporary worksite issues; (10) health and fitness for industry II; (11) microcomputers; (12) welding; and (13) cooperative education--building construction. Each course includes some or all of the following elements: an introduction, comments on course activities and design, prerequisite knowledge and skills, evaluation, instructional goals and objectives, and worksheets. (NLA)

ED331994

WOMEN IN EDUCATION FOR APPRENTICESHIP AND NON-TRADITIONAL EMPLOYMENT

FINAL PERFORMANCE REPORT

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
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CE057917

PORTLAND COMMUNITY COLLEGE

P.O. Box 19000
Portland, OR 97219-0990
Telephone 503/244-6111

May 6, 1991

Juanita Bowe
U.S. Department of Education
Grant and Contract Services, Grants Division
ROB #3, Room 3653
400 Maryland Avenue, S.W.
Washington, D.C. 20202-4835

Dear Ms. Bowe:

Enclosed is the Final Performance Report for the following grant:

- Award #V199A90118
- Program Title: Coop/Demo Program for High Technology Training
- Funding Agency: Office of Vocational and Adult Education, U.S. Department of Education
- Project Title: Women in Education for Apprenticeship and Non-Traditional Employment: WEANTE
- Revised Project Title: Building Futures in Industry and Trades: B-FIT
- Final Performance Report prepared May 6, 1991

We are extremely pleased that Portland Community College has continued the complete B-FIT program with general funding for the school year 1990/91. The program will continue as an on-going vocational training program in the Building Construction Technology Department at PCC. In addition, the program model is being used as a guide in evaluating and restructuring other vocational programs.

The following information is included in the Final Performance Report package.

- Final Performance Report
- Final Budget Report
- Third Party Evaluation
- Appendix
  - Catalogue Description
  - Course Training Outline
  - Training Objectives
  - Course Content Guides
  - Sample Class Schedule
  - Student Orientation/Screening Procedures
  - Brochure and Poster
  - News Articles
  - Job Placement Status Report
  - Advisory Committee
  - Training Video
  - Lift America Award Video

AN AFFIRMATIVE ACTION EQUAL OPPORTUNITY INSTITUTION

We are sending two copies of the Final Performance Report package to each of the six Curriculum Coordination Centers and to ERIC clearinghouse.

Sincerely,

Gail Smith
Director, Building Futures in Industry and Trades (B-FIT)

GS/sf

Enclosures

C: Bob Miller, Program Officer

Granite

U.S. DEPARTMENT OF EDUCATION
WASHINGTON, D.C. 20202

GRANTS AND CONTRACTS SERVICE

GRANT AWARD NOTIFICATION

RECEIVED NOV 23 1988

1 RECIPIENT NAME

Portland Community College
Office of the President
12000 SW 49th Avenue
Portland, OR 97219

2 PROJECT TITLE

Women in Education for Apprenticeship and Non-Traditional Employment

3 PROJECT STAFF

RECIPIENT PROJECT DIRECTOR

Donald Johnson 503-244-6111

EDUCATION PROGRAM STAFF

Robert L. Miller 202-732-2428

EDUCATION GRANTS STAFF

JUANITA BOWE 202-732-3461

4 AWARD INFORMATION

PR/AWARD NUMBER	V199A90118
ACTION NUMBER	01
ACTION TYPE	NEW
AWARD TYPE	DISCRETIONARY

5 AWARD PERIODS

BUDGET PERIOD	01/01/89 - 06/30/90
PROJECT PERIOD	01/01/89 - 06/30/90

6 AUTHORIZED FUNDING

THIS ACTION	312,287
CARRY OVER	
BUDGET PERIOD	312,287
PROJECT PERIOD	312,287
RECIPIENT COST SHARE	25%

7 ADMINISTRATIVE INFORMATION

PAYMENT METHOD	ED PMS
ENTITY NUMBER	1-930575187-A1
REGULATIONS	34 CFR 74, 75, 77, 78, 79 34 CFR 412
ATTACHMENTS	AB D

8 LEGISLATIVE & FISCAL DATA

AUTHORITY: Carl D. Perkins Vocational Education Act of 1984
PROGRAM TITLE: Coop/Demo Program for High Technology Training CFDA 84.199A

APPROPRIATION	FY	CAN	OBJECT CLASS	AMOUNT
91 8/90400	89	E002626	4115	312,287

9 TERMS AND CONDITIONS OF AWARD

THE FOLLOWING ITEMS ARE INCORPORATED IN THE GRANT AGREEMENT:
1) THE RECIPIENT'S APPLICATION (BLOCK 2),
2) THE APPLICABLE EDUCATION DEPARTMENT REGULATIONS (BLOCK 7).

OTHER INFORMATION AFFECTING THIS ACTION IS PROVIDED IN THE ATTACHMENTS SHOWN IN BLOCK 7.

RECEIVED
NOV 10 1988
Portland Community College
President's Office

VICTOR WESTBROOK
GRANTS OFFICER

NOV 1 1988
DATE

Ver. 1

5

ED - GCS 007 (9/87)

PLEASE SEE OTHER SIDE FOR MORE INFORMATION

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1. Final Performance Report

2. Final Budget Report

3. Third Party Evaluation

4. Appendix

Award #VI99A9011B

FINAL PERFORMANCE REPORT

Portland Community College formed a partnership with private industry and public agencies to develop and implement a comprehensive program at the college's Rock Creek Campus to enable women to enter apprenticeship and other non-traditional employment in the building trades. The partners were prompted by evidence in two areas: (1) the urgent need of women to enter male-dominated occupations and close the earnings gap which has made them the majority of persons with incomes below the poverty level in Oregon and the United States today: "All other things being equal, if the proportion of the poor who are female-headed families were to increase at the same rate as it did from 1967 to 1977, they would comprise 100 percent of the poverty population by about the year 2000 ("Wider Opportunities for Women," National Advisory Council on Economic Opportunity, 1983, p.1) and (2) the shockingly low 3.4 percent of Oregon's apprentices who were women in 1987, down from 5.9 percent in 1986. The program recruits, trains, and places women in a wide range of non-traditional employment and apprenticeship programs. The program provides the necessary encouragement, physical-fitness training, hands-on shop courses work/training, transitional worksite training, and networking linkages that ensure success. In 1989, the Building Futures in Industry and Trades program (B-FIT), under the name "Women in Education for

Apprenticeship and Non-Traditional Employment," received full funding from the U.S. Department of Education, Cooperative Demonstration Program for High Technology Training, as an 18-month pilot program to demonstrate that cooperation among the private sector, public service agencies, and public agency in vocational education can design, develop, and implement a successful program which:

- [ ] Offers the opportunity and facilitates the choices for women to become self-sufficient.
- [ ] Recruits a broad range of women into non-traditional employment in the trades.
- [ ] Successfully trains women to enter a wide range of non-traditional employment and apprenticeship programs.
- [ ] Places women in non-traditional employment and apprenticeship and enables them to succeed.

On September 30, 1990, this pilot project was completed. Through B-FIT, a model has been developed to recruit, train, place, and maintain women in apprenticeship and the trades where they earn family-wage jobs. Barriers to the success of women in these fields are being eliminated. Moreover, there have been unexpected results in the number of women interested in participating in the program, the number of program completers who have been employed, in the wages program completers are earning, and in the national recognition the program has received. B-FIT has an active recruiting list of 520 women from those who attended orientation and information sessions.

Even more unexpected is the entry-level salary of program completers. The pre-program median wage of the students was $6.88 an hour. B-FIT's expectations for completers were $8 and hour. Many of the women are entering the work force with $11 to $14 an hour. The average exit wage is now $9 an hour, with earning potential of $13 to #21 an hour. Moreover, 88 percent of the graduates are employed. Following the success of the model program in surpassing its goals, the Oregon Bureau of Labor and Industry nominated B-FIT for the national labor Investing for Tomorrow--the LIFT--awards. Secretary of Labor Elizabeth Dole presented B-FIT with the award in 1990, one of sixteen awards in the nation and the only Lift America Award presented to a community college.

B-FIT includes components to ensure that students successfully complete training to enter industrial and building trades in a comparatively short time and also to gain and maintain employment in male-dominated workplaces with an expectation of earning a livable wage. These components include:

- [] Building solid partnerships with Oregon's Bureau of Labor and Industries, labor unions, employers and social service agencies. Barriers are being eliminated by this partnership.

- [] Fast-paced, short-term program: 7 hours a day, 5 days a week, for 6 months. This total immersion allows women to complete the 38 required credits in two terms and quickly return to the job markets with certified skills and significant wage increases. The immersion more nearly duplicates the demands women will face on the job.

[] Referrals and assistance in meeting personal crises. By helping to solve urgent problems such as transportation, financial emergencies, and child care, B-FIT assists women to continue who would otherwise drop out of the program.

[] Unique and comprehensive approach to training which goes beyond the teaching of basic trades skills. Training includes building basic reading and math skills; tutoring to meet entry-level apprenticeship program qualifications; physical strength-building; computer; first aid and safety training; hands-on work-site experience.

[] Job development. B-FIT program staff develops employment opportunities for program completers. Job search skills are a part of each woman's training to help place her in a competitive position for these opportunities. Job leads and career advising are provided individually after graduation.

[] Support for graduates. Graduates are networked to existing groups of working tradeswomen as well as to prior graduates to provide job networking, problem solving, and support. Formal on-going support is provided through monthly "Job Club" following graduation. This peer and staff support helps graduates deal with and overcome any difficulties they may encounter at the worksite.

The first two B-FIT classes (1989-90) included 106 women. Of these, 85 (80 percent) graduated and 96 percent were employed upon graduation. Class 2 boasts 90.5 percent employed upon graduation. Classes 3 and 4 enrolled a total of 86, of whom 79 graduated. (Employment figures will be finalized six months after graduation of these last two classes.) Enrollment for fall 1991 is already at 35. The women of the first four classes have 218 children among them; 77 percent are single heads-of-households; 33 percent were assisted by

welfare; 16.5 percent are ethnic minorities; and 41 percent received federal financial aid and/or scholarship assistance through the college foundation.

B-FIT was designed as a federal demonstration project with the goal of providing a blueprint for other community colleges and technical training programs to follow. Focused efforts have been made to foster replication. Staff have made presentations at national and regional conferences, where visitations to the on-going program has been solicited. Materials for distribution at conferences and at program-site visitations include program design, project evolution, curriculum, program promotional materials, sample lesson plans, participating agencies and employers, evaluation of the project, and placements. A video-tape of women in training and at the worksite, which includes teaching, coaching, and networking techniques, have been featured at the conferences. Articles have been submitted and published in local and national newspapers and professional journals. To date, complete project replication information has been disseminated at the request of at least 75 other colleges and organizations throughout the United States.

FINANCIAL STATUS REPORT

(Follow instructions on the back)

1. FEDERAL AGENCY AND ORGANIZATIONAL ELEMENT TO WHICH REPORT IS SUBMITTED: US Department of Education	2. FEDERAL GRANT OR OTHER IDENTIFYING NUMBER: V199A90118-89	OMB Approved No. 80-R0180	PAGE 1 OF 1 PAGES	
3. RECIPIENT ORGANIZATION (Name and complete address, including ZIP code): Portland Community College, PO Box 19000, Portland, Oregon 97219-0990	4. EMPLOYER IDENTIFICATION NUMBER: 1-930575187-A1	5. RECIPIENT ACCOUNT NUMBER OR IDENTIFYING NUMBER: 4-21-0359	6. FINAL REPORT: [X] YES [ ] NO	7. BASIS: [ ] CASH [X] ACCRUAL
	8. PROJECT/GRANT PERIOD (See instructions) FROM: 1/1/89 TO: 9/30/90		9. PERIOD COVERED BY THIS REPORT FROM: 1/1/89 TO: 9/30/90	

10. PROGRAMS/FUNCTIONS/ACTIVITIES ►	(a)	(b)	(c)	(d)	(e)	(f)	TOTAL (g)
	STATUS OF FUNDS						
a. Net outlays previously reported	$ -0-	$	$	$	$	$	$ -0-
b. Total outlays this report period	458,537						458,537
c. *Less:* Program income credits	-0-						-0-
d. Net outlays this report period *(Line b minus line c)*	458,537						458,537
e. Net outlays to date *(Line a plus line d)*	458,537						458,537
f. *Less:* Non-Federal share of outlays	146,250						146,250
g. Total Federal share of outlays *(Line e minus line f)*	312,287						312,287
h. Total unliquidated obligations	-0-						-0-
i. *Less:* Non-Federal share of unliquidated obligations shown on line h	-0-						-0-
j. Federal share of unliquidated obligations	-0-						-0-
k. Total Federal share of outlays and unliquidated obligations	312,287						312,287
l. Total cumulative amount of Federal funds authorized	312,287						312,287
m. Unobligated balance of Federal funds	-0-						-0-

11. INDIRECT EXPENSE	a. TYPE OF RATE *(Place "X" in appropriate box)* [ ] PROVISIONAL [X] PREDETERMINED [ ] FINAL [ ] FIXED	b. RATE	c. BASE	d. TOTAL AMOUNT	e. FEDERAL SHARE
		45%	219,451	98,753	16,000

12. REMARKS: *Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation.*

13. CERTIFICATION: I certify to the best of my knowledge and belief that this report is correct and complete and that all outlays and unliquidated obligations are for the purposes set forth in the award documents.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL: H. E. Lile

DATE REPORT SUBMITTED: 4/22/91

TYPED OR PRINTED NAME AND TITLE: H. E. Lile, Director of Business Svc

TELEPHONE (Area code, number and extension): 503-273-2808

269-102

STANDARD FORM 269 (7-76) Prescribed by Office of Management and Budget Cir. No. A-110

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December 14, 1990

Robert L. Miller, Technical Assistant
OVAE/DNP/PIB
400 Marilyn Avenue S.W.
Mary E. Switzer Building
Mail Station Room 4512
Washington, D. C. 20202-7242

Dear Mr. Miller,

I am enclosing the third party evaluation of the B-FIT Program at Portland Community College that I have just completed. Gail Smith, Program Director, asked me to send you this report as a part of the requirement for the demonstration project completion.

As you will see from the evaluation, I think very highly of the program and what has been accomplished during the demonstration project.

If you have questions or concerns about the evaluation, please feel free to contact me at the address below, or Gail Smith at the Program offices.

Sincerely,

Maurine Barnett

Maurine Barnett, Consultant
5005 192nd S.W.
Lynnwood, Washington 98036

THIRD PARTY EVALUATION

B-FIT PROGRAM

PORTLAND COMMUNITY COLLEGE

December 14, 1990

Evaluator: Maurine Barnett, Consultant
5005 192nd S.W.
Lynnwood, Washington 98036

I. EVALUATION PROCESS/SUMMARY

Composing this evaluation at the computer in the warmth of my office in December, I realize that to fully capture the flavor of my impressions when visiting campus last June and August is a frustrating and elusive task. However, having a period of several months between the visits and writing the final report has also allowed much of the wheat to separate from the chaff. Many of the small details that seemed so important while observing an interview, for example, have diminished in importance, and strong initial impressions have become clearer.

The overall "big picture" that has emerged is that of a program which has a very strong foundation, with plenty of commitment and creative energy to carry it forward. The program has many, many strengths, and only a few weak spots; I hope that you will always keep that in mind when reading this evaluation. In looking at both strengths and weaknesses, I focused on those themes which repeated themselves in more than one way. Where possible, I have tried to point out the places or ways a theme was repeated. My only real concern for this program's continued success after such a strong start is that in merging into the community college structure after the initial demonstration period, the unique support its staff provides to the students will not be lost in the academic bureaucracy.

Information for this evaluation was acquired by making on-campus visits, having some familiarity with the program prior to the evaluation, and by reading and viewing the many program materials supplied by the B-FIT staff. During the two full-day campus visits, I observed instruction in weight training, electrical-mechanical, and construction classes, toured all facilities, met with students from class #2 for a 1 1/2 hour program evaluation, sat in on orientation and two interviews with prospective students, and conducted individual interviews with all staff, two employers, several graduates (working and non-working), and an advisory board member.

The evaluation is divided into five sections:

I. Evaluation process/summary
II. Outreach/recruitment
III. Curriculum design and delivery
IV. Job development/employment
V. Staff and support functions

It is my hope that this evaluation affirms the many strengths of the B-FIT program, and also gives the administration, staff, and students some new ideas to try. Even in the cold of December, the warmth, creativity and spirit of the program has stayed with me.

II. OUTREACH/RECRUITMENT

Outreach, recruitment and orientation efforts are one of the only areas of the program that I feel have come up with a mixed bag of results.

From my observations of such things as the outreach contacts list and statistics, outreach is an area where B-FIT shines. The outreach contacts list by itself is very impressive, especially for a project in its first year of operation. A measure of the outreach success is in the quantity and quality of women who wrote or called for information, attended orientation, and ended up graduating from the program. A lot of groundwork has obviously been laid here; well-deserved recognition should go to those involved in that outreach effort. That effort has been further bolstered, in my opinion, by an advisory group that shows strong commitment and concern for the program's success.

Although the number of women reached is excellent, minority recruitment is a major problem that needs to be addressed. From my discussions with staff, students, and an advisory board member, all are aware of this and have some strong ideas about increasing minority recruitment and retention. One of those awarenesses is that there needs to be at least one person of color on the staff; presently the staff and instructors are all white. Another idea mentioned, which I believe may be underway, is the establishment of a mentorship program between students, and women of color already working in the trades. Both ideas are good ones which should be acted upon. However, there is another aspect of the problem which concerns me, and that is the location of the program at a site too far away geographically from diverse ethnic populations. A remedy for this situation is much more elusive.

Another area for improvement in the outreach effort is in the quality of the video and printed materials the program uses. The two videos that I reviewed were amateurish and do not represent the program well to the public. I suggest that a professionally done video which gives an overview of the program and its successes to be an important part of the outreach/recruitment effort. The printed brochures and posters were obviously professionally done, but could be more creative and eye-catching. This is an area that perhaps the advisory board, using its professional contacts in the community, could help with.

Orientation is included in this part of the evaluation because it is a basic recruitment tool in that it provides a potential candidate with her first look at the program. After observing an orientation, reviewing the application packet, and sitting in on two interviews, I would say there are almost an equal number of strengths and weaknesses.

Overall, the orientation covers a wide variety of things in an efficient, compact manner, but not in much depth. This design is both its strength and its weakness. From both my own observation and student feedback, an area that needs to be examined in more depth during that day is the information on skilled trades, and the variety of work it encompasses. At the very least, using a video (such as "Trade Secrets") can help provide a better overview of blue collar work during orientation.

Particularly strong presentations during the orientation I attended were the discussion by the job developer of the step-by-step process of conducting a job search, and the explanation by the program director of what a student can expect to accomplish during the six month program. The staff clearly demonstrates their enthusiasm for the program in moments such as these.

III. CURRICULUM DESIGN AND DELIVERY

The curriculum, which has obviously been drawn heavily from a combination of existing college programs, is well-balanced and designed, but it is the individual instructors and their translation of the curriculum which makes the classroom experience so successful. The three components I observed: electrical/mechanical, construction/carpentry, and weight training, were all essentially strong and given high marks by the students, with only a few areas needing improvement in each. The one negative theme that I heard again and again, however, was the large number of students per instructor, especially given the lab-type structure of the classes.

A. ELECTRICAL/MECHANICAL

Students give this component high marks in terms of making them job-ready and competitive for the electrical trades. The instructor, whose lack of teaching experience was identified as a problem with the first class, has obviously come a long way fast. She exhibited a very relaxed, quiet style, but one that I did not interpret as weak. The final projects demonstration I observed involved a wide variety of ideas, all of which she obviously encouraged. I had the impression she is a very creative teacher. Many students identified lack of tools, supplies, and textbooks as areas needing improvement in this component.

B. CONSTRUCTION/CARPENTRY

When I observed this class, students were enthusiastically involved in the demolition of a large shed they had constructed earlier in the year. The quality of work looked very good, and the instructor commented that the student had developed better skills than he had ever anticipated. Students gave the instructor a lot of praise for his support, lack of "game-playing", and for being a positive role model. The curriculum covered a lot, including some hands-on back hoe experience. The shop, however, was very crowded, and obviously shared with other programs. Safety was the other concern I had; during my visit students were not wearing hard hats or safety goggles, and most were not wearing work boots when involved in a potentially dangerous project.

C. WEIGHT TRAINING

Again, this is a program component that is well-designed and enthusiastically received by the students. The instructor has an excellent background, including experience in police work. Her class is well-organized, with a focus on making sure her students see their strength and endurance improvement over the six month program. Four hours per week of physical conditioning is a minimum in preparing for blue collar work, however, and should be increased to six. Also, some students saw the instructor as rigid and dogmatic at times, but said they had good support from the program director for working through this issue.

Other curriculum components, not observed first hand, were First aid/CPR, Job and career skills, and an introductory computer class. Feedback from some students indicates that improvement is needed in the design of the computer class, and some feel it should be dropped altogether. I tend to agree with the latter view; in most industry jobs, workers will not be using a computer, but some will be using "computerized equipment", which involves a different kind of training.

IV. JOB DEVELOPMENT/EMPLOYMENT

Job development and employment outcomes are the bottom line measure of the whole program's effectiveness, and my assessment is that B-FIT is off to an impressive start. The placement report for July 31, 1990, not even a month after the second class graduated, showed an over 75% placement rate. From my previous experience in a non-traditional job skills program, a 60% placement rate is an average expectation for a new program. If the statistics seem almost too good to be true, there are some solid reasons for this above-average performance.

The program's job developer, Chris Jones, deserves very special recognition for her blend of caring and support she gives the students during the program and in their job search process. She also has worked very hard behind the scenes with employers, labor contacts, and apprenticeship programs. Students mentioned example after example where she went the "extra mile" to support them and provide them with information. Other behind the scenes support that has contributed to this early placement success includes the networking of the advisory board members and PCC staff, and the team work of the rest of the B-FIT staff.

Two employers that I spoke with, both of whom had hired more than one graduate of the program, were very enthusiastic. Praise went to the program for the excellent job-readiness they saw in the students they hired, and in some areas such as electrical knowledge, they felt the women were better prepared than most of the male apprentices. One employer had laid off one of the women she had hired, due to poor job performance, but even she was eager to hire a B-FIT graduate again.

Some students, during the time I spent with them in the program evaluation, pointed out a couple areas they want to see improved. They felt that not having a job search phone available to them during the day was a disadvantage, and many felt frustrated that they had only one job developer for 50 students. Several mentioned that they felt they had been mislead about placement from both a statement in the B-FIT brochure and in some overly-enthusiastic statements made by staff in orientation. They felt it was implied that they would be directly placed in jobs at the end of the program, and that employers were eagerly waiting to hire them. After reading the brochure, and sitting in an orientation, I can see how this impression may have been given. It would be wise for the program to make sure it sends a very clear message about job placement expectations in printed and verbal form. I think it is an inherent problem in any job skills program that students may hear only what they want about promises of getting a job, and no amount of clearly-worded messages will change that. But the program has a responsibility to represent itself as clearly as possible, which should eliminate some of the misunderstanding.

In summary, the suggestions above are only a small part of the bigger picture, and like I stated before, the placement and job development aspects of this program are excellent.

V. STAFF AND SUPPORT FUNCTIONS

It's often the small touches that illustrate the true bigger picture; things like the message center and suggestion box in the office, photographs of the students in their work clothes hung in a prominent place, or a potluck lunch where students and staff sit together "oohing and ahhing" over slides of the latest OJT project. In these places, and everywhere I poked and prodded, the bigger picture was that of an exceptionally supportive and enthusiastic staff, providing the glue that makes this program work so well.

This staff obviously functions as a strong team, and my sense is that there are no weak players. There were many compliments, from both students and staff, about Gail Smith's strong leadership style, her ability to provide just the right mix of compliments and honest, constructive criticism. Many also mentioned her ability to develop that sense of team, by valuing and including everyone on the staff in decision-making and goal-setting. But there were just as many compliments for Shirley Fugere, administrative assistant, about her ability to "find things in a storm of paperwork", and the positive first impression she provides for the program.

If there is a weakness in the staff support function, it is that the program is managed with a skeleton crew, the bare minimum, and that in the enthusiasm of a new staff for a new program, burnout is a definite possibility. My other concern, mentioned in the evaluation process/ summary page at the beginning, is that as the program is absorbed into the college, and becomes tuition-based, that the uniqueness of the program is not diminished. I believe that non-traditional skills programs have "non-traditional" needs, including counselors, instructors, and support staff who are able to devote more time to the teaching, placement and follow-up required to help the students succeed as they forge new ground in the job market. Placement of a woman on a construction site, as a new apprentice, requires more support than placing a student in a electronic technician job, for example.

If there is any doubt about the program's success, on the part of any staff, student, or college administrator, I would like to leave you with the confession a recent graduate made to me when I interviewed her about her experience at B-FIT:

> "I got up every morning at five o'clock to take my kids to daycare and hitchhike to school; I knew it was dangerous, but if I didn't, I wasn't only letting myself down, but my mother too. Very few women get the chance to do this; I am one of the lucky ones....my mother wasn't...."

APPENDIX

1. Catalogue Description
2. Course Training Outline
3. Training Objectives
4. Course Content Guides
5. Sample Class Schedule
6. Student Orientation/Screening Procedures
7. Brochure and Poster
8. News Articles
9. Job Placement Status Report
10. Advisory Committee
11. Training Video
12. Lift America Award Video

91-92 Catalogue Description
March 7, 1991

B-FIT Program
(Building Futures in Industry and Trades)

Rock Creek Campus
Building 2, Room 102
244-6111, ext. 7449

Career Description: This two-term certificate program gives students a unique hands-on experience in many of the basic skills required to enter an apprenticeship training program or other skilled non-traditional jobs in industry. Program focus is on the construction, electrical and mechanical trades.

Program Prerequisites: The B-FIT program is specifically designed for women preparing to work in skilled trades jobs. Any student who meets program qualifications is eligible. Students must meet the program physical requirements, be able to read, write, speak and listen in English, and have the ability to do basic math computations. Apply directly to the B-FIT program and attend an orientation.

Course of Study: A series of courses structured to prepare students for entry into apprenticeship programs and other non-traditional occupations. Selected courses introduce industrial skills training in the construction, electrical and mechanical trades, trades math, shop course work, physical strength training, job safety, researching industrial occupations, microcomputer familiarization, and optional coop-ed work experience.

PCC offers the following form of recognition. *Certificate of Completion - 34 credit hours as outlined in the sequence of courses.

TERM ONE

Course No.	Title	Lec hr/wk	Lab hr/wk	Cr
BCT 3.201	Introduction to Applied Construction: Part I (5-week course)	5	15	5
BCT 3.202	Introduction to Electrical/Mechanical Trades: Part I (5-week course)	5	15	5
BCT 3.129	Basic Trades Builders Math	2		2
BCT 3.203	Orientation To Vocational Training for Skilled Trades and Industry	1		1
BCT 3.204	Targeting Occupations In Skilled Trades and Industry	2		2
HPE 296	Health And Fitness For Industry	1	4	2

TERM TWO

Course No.	Title	Lec hr/wk	Lab hr/wk	Cr
BCT 3.210	Introduction to Applied Construction: Part II (5-week course)	5	15	5
BCT 3.211	Introduction to Electrical/Mechanical Trades: Part II (5-week course)	5	15	5
BCT 3.222	Contemporary Worksite Issues	3		3
HPE 297	Health And Fitness For Industry	1	3	2
BT 2.170	Introduction Micro Computer	1		1
WLD 9.050AC	Welding (1 Week Course)		20	1
3.280AA	Cooperative Education: Building Construction (Optional Course)			1<12

*Students may earn a one-year certificate by completing the following requirements:

1. One, three(3)-credit elective course
2. Nine credits general education courses
3. Meet PCC exit competencies

#155.wpc

INDUSTRIAL SKILLS
TRAINING COURSE OUTLINE

Construction Trades Basic Skills

A. Basic and Trade Math

1. Basic math review
2. Fractions
3. Decimals
4. Percentage
5. Conversion
6. Problem solving
7. Linear measurement
8. Plane geometry
9. Metrics

B. Blueprint Reading and Drawing

1. Blueprint introduction and familiarization
2. General terms
3. Building and metal trade terms
4. Views
5. Dimensioning
6. Lines
7. Trade sketching
8. Working drawings

C. Personal and Construction Safety

1. Personal
2. Hand and power tools
3. Housekeeping
4. Scaffolding and ladders
5. Electrical
6. Machinery guarding
7. First aid
8. Height hazards

D. Use and Care of Hand and Power Tools

1. Hand tools
2. Small power tools
3. Power tools
4. Specific safety requirements
5. Practical application

E. Heavy Repetitive Tasks

1. Ditch digging
2. Lifting, carrying and stacking materials
3. Scaffolding climbing with material moving
4. Raising and lowering materials with pulley
5. Other tasks

F. Introduction to Welding

1. Welding safety
2. Soldering
3. Oxygen and acetylene cylinders
4. Regulators, torches and other equipment
5. Flame adjustment
6. Set-up
7. Straight line cutting
8. Piecing and hole cutting
9. Introduction to arc welding

Electrical/Mechanical Basic Skills

A. Electricity/Electronics

1. Electric circuits
2. Resistance
3. Resistors
4. Ohm's law
5. Series circuits
6. Parallel circuits
7. Series parallel circuits
8. Practical trouble shooting

B. Electro-Mechanical Devices: theory and uses

1. Tool use and identification
2. Lights
3. Switches
4. Relays
5. Solenoids
6. Motors
7. Transformers
8. Capacitators

C. Practical Application and Troubleshooting

1. Test instruments
2. Machine inspection
3. Machine disassemble
4. Machine assembly
5. Operation and cleaning
6. Wiring diagrams and schematics
7. Residential wiring
8. Component assembly
9. Parts identification and classification
10. Troubleshooting

Both Construction Trades/Electrical Mechanical

Lab Experiences:

Ninety hours of lab activities from this list

- Ditch digging
- Scaffolding - erecting and climbing
- Heavy repetitive tasks
- Cutting and measuring - using tape measure and micrometer
- Nail hammering
- Handtool I.D.
- Power tool operation - table saw, circular saw, electric drill, grinder, jigsaw
- Care of tools
- Electrical cords
- Plumb bob
- Carrying pipe
- Boxes with holes drilled in them
- Steel tying
- Pipe cutting and threading
- Soldering -pipe
- Valve disassembly and I.D.
- Concrete forms, footings and slabs
- Steel grinding
- Tool boxes, wooden cubes
- Pipe assembly
- Overhead nailing
- Engine tear down
- Oxy-acetylene cutting
- Oxy-acetylene welding
- Arc welding
- Sheet metal construction
- Laying block
- Storage sheds and small structures
- 8 X 8's
- Miscellaneous jobs as available
- Wiring
- Piping
- Transit
- Use of electrical test equipment
- Building circuits with switches, lights, etc.

Life Skills

1. Introduction to career planning
2. Values clarification
3. Goal setting
4. Problem solving techniques
5. Sexual harassment
6. Assertiveness
7. Support group

Job search Skills

1. Job seeking
2. Application and interview process
3. Employer expectations
4. Co-worker expectations
5. Wages, benefits and working conditions
6. The worker's responsibilities
7. Apprenticeship system
8. Job club

Strength Building

1. Body Conditioning
2. Weight Lifting
3. Aerobic Exercise
4. Body/Strength Building

CPR

1. Anatomy and physiology of the cardiovascular and respiratory systems.
2. Risk factors for heart attack
3. Prudent heart living
4. Recognition of heart attack
5. Signals and action for survival
6. Sudden death
7. Airway obstruction: incidence, causes, prevention, recognition
8. Manikin demonstration for one-rescuer CPR
9. Simulated demonstration of airway obstruction in the conscious victim and the unconscious victim.
10. Manikin practice
11. Performance and written testing

Introduction to the Microcomputer

1. Orientation to the microcomputer
2. Vocabulary of basic computer terms
3. Microcomputer operation
4. Developing a data disk filing system

Transitional Worksite Training

1. Orientation to project and worksite
2. Basic plans of construction and electrical/mechanical
3. Construction of project
4. Electrical installation
5. Evaluation

ELECTRICAL/MECHANICAL BASIC SKILLS

Objective #1. Students will understand the basic theories of AC/DC electricity, electronics, electrician circuits, switches and symbols...

Competency Measure:

A. Students will pass with a minimum proficiency of 70% instructor-developed examinations.

B. Instructor observation.

Objective #2. Using approved test equipment, students will be able to check accurately circuit voltages and amperage.

Competency Measure: Instructor observation

Objective #3. Using Ohm's law, students will be able to calculate electrical circuit resistance, voltage and amperage.

Competency Measure:

A. Students will pass with a minimum proficiency instructor-developed examination.

B. Instructor observation.

Objective #4. Students will be able to wire parallel and series circuits, switches, lights and motors.

Competency Measure:

A. Students will pass with a minimum proficiency of 70% instructor-developed examinations.

B. Instructor observation.

Objective #5. Students will be able to disassemble and reassemble internal-combustion engine components, electric motors and valves.

Competency Measure: Instructor observation

Objective #6. Students will understand basic math functions to include whole numbers, fractions, decimals and percentages.

Competency Measure: Students will pass with a minimum proficiency of 70% instructor-developed examinations.

Objective #7. Students will demonstrate positive attitudes as they relate to cooperating with co-workers.

Competency Measure: Instructor observation

Objective #8. Student will be able to troubleshoot a variety of electrical and mechanical devices.

Competency Measure: Instructor observation of successful analysis.

Objective #9. Student will be able to repair and perform maintenance on a variety of electrical and mechanical devices.

Competency Measure: Instructor observation

Objective #10. Students will visit a job site that involves electrical/mechanical jobs.

Competency Measure: Attendance, Instructor observation

EMPLOYMENT SKILLS

Objective #1. Student will explore personal values and how they effect communication.

Competency Measure: Each student shall participate in a values auction and accomplish a values identification.

Documentation: Student will have assignment completion documented in employment skills grade book.

Objective #2. Student will become familiar with problem-solving strategies and how to avoid crisis both in personal and on the job-site situations.

Competency Measure: Students will participate in group activity involving identifying local resources for problems that may arise during training.

Documentation: Participation will be documented in attendance record employment skills class.

Objective #3. Student will learn how to set and achieve goals.

Competency Measure: Each student shall project their goals for the next two years.

Documentation: Participation will be documented in attendance record employment skills class.

Objective #4. Students will learn the concepts of effective communication and how to be assertive.

Competency Measure: Student will participate in an assertiveness role play.

Documentation: Participation will be documented in attendance record employment skills class.

Objective #5. Student will become familiar with what constitutes sex harassment, how to handle it, and the legal rights involved.

Competency Measure: Each student shall participate in a role-play about sex harassment.

Documentation: Participation will be documented in attendance record employment skills class.

Objective #6. Student will have the opportunity to do career planning based on each individual skills and competencies.

Competency Measure: Student shall research at least five careers.

JOB SEARCH SKILLS

Objective #1. Students will be able to explore three job options.

Competency Measure: Student submits at least three informational interviews.

Documentation: Student will have assignment completion documented in employment skills grade book.

Objective #2.	Student will be able to complete resume that can be used for non-traditional job search.
Competency Measure:	Student submits resume assignment and skills I.D. assignments.
Documentation:	Student will have assignment completion documented in employment skills grade book.
Objective #3.	Student will exhibit ability to complete employment applications.
Competency Measure:	Participation in employment skills class and weekly job club. Completion of class assignments in job search. Observation of Employment Skills Instructor and Employment Coordinator.
Documentation:	A copy of a completed master employment application will be placed in student's file.
Objective #4.	Student will exhibit capability in employment interviews.
Competency Measure:	Participation in employment skills class. Completion of video taped mock interview and/or employer feedback of actual employment interview. Observation of Employment Skill Instructor.
Documentation:	Video taped interviews will be kept on file for limited amount of time.
Objective #5.	Student will have basic understanding of apprenticeship system.
Competency Measure:	Student will complete an apprenticeship quiz at 70% or higher.
Documentation:	Participation will be documented in attendance record for employment skills.
Objective #6.	Student will have the opportunity to meet at least five tradespeople to get the opportunity to explore career choices.
Competency Measure:	Observation of participation in class.
Documentation:	Participation will be documented in attendance record for employment skills.

STRENGTH BUILDING

Objective #1. Student will learn basic health and nutritional concepts that encourage strength.

Competency Measure: Student will achieve 70% higher on written exam.

Documentation: Unit grade in student file.

Objective #2. Student will be able to lift properly 50lbs.-100lbs. objects from floor to waist.

Competency Measure: Instructor observation of performance recorded on fitness activities grid.

Documentation: Activity grid in student file.

Objective #3. Students will build their cardiovascular endurance.

Competency Measure: Student will demonstrate an increase in endurance by pre- and post-test measure.

Documentation: Physical fitness endurance pre- and post-test in student file.

CPR

Objective #1. Students will understand the risk factors, recognize symptoms and airway obstructions in relation to the cardiovascular and respiratory system.

Competency Measure: Students will pass with 90% proficiency on instructor constructed evaluation.

Documentation: Examination and grades in student file.

Objective #2. Students will practice on rescuer CPR and airway obstruction removal.

Competency Measure: Student demonstration of proper technique.

Documentation: Instructor observation and grade in student file.

Objective #3. Students will perform CPR techniques and written test with 90% performance.

Documentation: Grades in student file and award of CPR card.

INTRODUCTION TO MICROCOMPUTER

Objective #1. Students will describe basic components of computer and develop working knowledge of basic computer. terms.

Competency Measure: Students will be tested on basic component terms.

Documentation: Grades in student file

Objective #2. Students will develop a working knowledge of the computer and an efficient method for storing data electronically.

Competency Method: Student performance of computer and demonstration of techniques of storing data.

Documentation: Student assignments evaluation by instructor and grade in student file.

Objective #3. Students will demonstrate a working knowledge of the computer.

Competency Method: Performance test.

TRANSITIONAL WORKSITE TRAINING

Objective #1. Students will apply competency skills learned in construction (objectives 1-10) and electrical/mechanical (objectives 1-10) training in an actual construction project.

Competency Measure: Application of construction and electrical/mechanical (objectives 1-10) on-site with instructor evaluation.

Demonstration: Unit grade in student file.

Objective #2. Students will learn application of cooperation, teamwork compliance with orders "on-the-job" application of safety rules and regulations ont he construction project.

Competency Measure: Instructor evaluation.

Documentation: Unit grade in student file.

B-FIT Program

Course Content Guides

Portland Community College

B-FIT COURSE CONTENT GUIDE

TABLE OF CONTENTS

B-FIT, 91/92 Catalogue Description

TERM I

BCT 3.201	Introduction to Applied Construction, Part I
BCT 3.202	Introduction to Electrical/Mechanical, Part I
BCT 3.129	Basic Trades Builders Math
BCT 3.203	Orientation to Vocational Training for Skilled Trades and Industry
BCT 3.204	Targeting Occupations in Skilled Trades and Industry
HPE 296	Health and Fitness for Industry

TERM II

BCT 3.210	Introduction to Applied Construction, Part II
BCT 3.211	Introduction to Electrical/Mechanical, Part II
BCT 3.222	Contemporary Worksite Issues
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BT 2.170	Introduction to Micro Computer
WLD 9.050AC	Welding (1-week course)
BCT 3.280AA	Cooperative Education: Building Construction (Optional Course)

91-92 Catalogue Description
March 7, 1991

B-FIT Program
(Building Futures in Industry and Trades)

Rock Creek Campus
Building 2, Room 102
244-6111, ext. 7449

Career Description: This two-term certificate program gives students a unique hands-on experience in many of the basic skills required to enter an apprenticeship training program or other skilled non-traditional jobs in industry. Program focus is on the construction, electrical and mechanical trades.

Program Prerequisites: The B-FIT program is specifically designed for women preparing to work in skilled trades jobs. Any student who meets program qualifications is eligible. Students must meet the program physical requirements, be able to read, write, speak and listen in English, and have the ability to do basic math computations. Apply directly to the B-FIT program and attend an orientation.

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BCT 3.203	Orientation To Vocational Training for Skilled Trades and Industry	1		1
BCT 3.204	Targeting Occupations In Skilled Trades and Industry	2		2
HPE 296	Health And Fitness For Industry	1	4	2

TERM TWO

Course No.	Title	Lec hr/wk	Lab hr/wk	Cr
BCT 3.210	Introduction to Applied Construction: Part II (5-week course)	5	15	5
BCT 3.211	Introduction to Electrical/Mechanical Trades: Part II (5-week course)	5	15	5
BCT 3.222	Contemporary Worksite Issues	3		3
HPE 297	Health And Fitness For Industry	1	3	2
BT 2.170	Introduction Micro Computer	1		1
WLD 9.050AC	Welding (1 Week Course)		20	1
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1. One, three(3)-credit elective course
2. Nine credits general education courses
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INTRODUCTION TO APPLIED CONSTRUCTION I

BCT 3.201
5-Week Course

5 Credits
5 Lecture
15 Lab
100 Clock

BUILDING CONSTRUCTION
TECHNOLOGY

COURSE CONTENT GUIDE

Prepared by John Fulton
Bob Wolever
Glen Fors

DEFINED OUTCOMES

This section is a statement of final learning outcomes and does not attempt to state how, or in what order, the defined outcomes will be presented.

The following factors will influence the student's ability to complete the defined outcomes:

Motivation and attendance, speed of mastering the subject matter.

I. PURPOSE

The purpose of this course is to develop an understanding of the hand tools and power tools used in the construction trades. The student will be exposed to the various building materials related to residential construction. These skills will be put to use in a variety of hands-on projects including floor and wall framing.

II. INTRODUCTION

After completing this course the student should be able to identify the commonly used hand/power tools for the construction industry. The student should be able to choose the correct tool to do the work in a safe and competent manner. Safety and care of the tools will be highly emphasized.

III. COMMENTS ON COURSE ACTIVITIES AND DESIGN

The student's time is divided between lecture/discussion/demonstration and lab experiences. The student will be given a series of projects where they will show their competence in the proper use and care of construction hand/power tools and equipment.

IV. PREREQUISITE KNOWLEDGE AND SKILL

None

V. EVALUATION

Evaluation procedures will be discussed during the first class session.

VI. COURSE OUTLINE

This is a topical outline and is not necessarily the sequence in which the material will be presented.

1. Hand tools/power tools, use and safety
2. Power tools
3. Materials of construction
4. Drywall
5. Materials handling
6. Floor framing
7. Job site visit

1.0 HAND TOOLS/POWER TOOLS, USE AND SAFETY

Objectives for the student

1.1 To be able to identify the correct tool(s) to do the assigned projects.

1.2 To show competence in using the tool(s) to perform the assigned projects.

1.3 To show the safe way to use the tool(s).

1.4 To show the proper care, maintenance and sharpening of the tool(s).

1.5 To instill in the student the skill of understanding the names, uses and purposes of various materials of construction found and used on the job site.

1.6 From a blueprint or instructor direction:

- A. Be able to select the correct material for the projects.
- B. Be able to select the correct tool(s) to assemble the projects.
- C. Show competence in completing the projects in a safe manner.

1.7 Hammers
- A. Curved claw
- B. Straight claw
- C. Sledge hammer
- D. Framing

1.8 Hand Saws
- A. Crosscut
- B. Finish
- C. Rip
- D. Back saw (miter box)
- E. Dovetail
- F. Compass (keyhole)
- G. Coping
- H. Hacksaw

1.9 Squares
- A. Framing
- B. Combination
- C. Try
- D. Sliding T-Bevel
- E. Speed

1.10 Planes
- A. Block
- B. Bench
- C. Smoothing
- D. Jointer

1.11 Measuring Instruments
- A. Flexible steel tape
  - a. 6-25 ft.
  - b. 100 ft
- B. Folding (zig-zag)rule

1.12 Leveling and Plumbing
- A. Spirit level
- B. Builders level
- C. Torpedo level
- D. Line level
- E. Water level
- F. Laser-beam level
- G. Plumb Bob

1.13 Hole Boring Tools
- A. Hand Brace
  - a. Auger bits
  - b. Expansion bits
  - c. Lockset bit
  - d. Hole saw
  - e. Flat fact bit-for power drills
  - f. Twist drills-for power drills
- B. Hand drills (eggbeater)
- C. Push drill

1.14 Screw Drivers
- A. Standard or flat blade
- B. Phillips
- C. Clutch head
- D. Torx head
- E. Square head
- F. Spiral ratchet
- G. Offset
  - a. Flat
  - b. Phillips

1.15 Files
- A. Flat
- B. Round
- C. Half round
- D. Square
- E. Triangular
- F. Slitting
- G. Cant H. Knife
- I. Rasp

1.16 Chisels
- A. Wood
- B. Cold
- C. Brick
- D. Stripping
- E. Floor
- F. Ripping (catspaw)

1.17 Clamps
- A. Bar
- B. Pipe
- C. C
- D. Hand screw
- E. Locking
- F. Spring
- G. Web

1.18 Concrete Tools
- A. Trowel
- B. Float
- C. Bull float
- D. Vibrator
- E. Edger
- F. Groover
- G. Finish broom
- H. Tamper

1.19 Misc. Tools and Equipment
- A. Dividers and scribes
- B. Nail set
- C. Tin snip
- D. Putty knife
- E. Oil stone
- F. Butt gauge
- G. Tap & Tap wrench
- H. Stair gauge clamps
- I. Chalk line
- J. Wire stripper/crimper
- K. Goggles
- L. Hard hat
- M. Safety shoes
- N. Nail apron
- O. Nail puller
- P. Prybar
- Q. Stapler
- R. Awl
- S. Ladders
- T. Ladder Jacks
- U. Safway Scaffolding
- V. Built in place scaffold

2.0 POWER TOOLS

2.1 Table Saw
- A. Blades
  1. Combination
  2. Chisel tooth
  3. Rip
  4. Carbide tip
  5. Hollow ground
  6. Dado

2.2 Radial arm

2.3 Portable-(hand held)

2.4 Miter

2.5 Band saw

2.6 Reciprocating

2.7 Jointer

2.8 Planer
- A. Floor model
- B. Portable (hand held)

2.9 Shaper

2.10 Bench grinder

2.11 Drills
- A. Floor Model
- B. Bench Model
- C. Portable (hand held)

2.12 Sanders
- A. Floor model
- B. Disc/belt combination
- C. Portable belt (hand held)
- D. Portable disc (hand held)

2.13 Router

2.14 Rotary hammer

2.15 Pneumatic fasteners
- A. Nailer
- B. Stapler

2.16 Powder activated tools

2.17 Jig saw

PROJECTS

BCT 1.197 Hand/Power tools--Use and Safety

1. Hone a chisel
2. Build a saw horse
3. Various as assigned by instructor

3.0 MATERIALS OF CONSTRUCTION

3.1 Wood Lumber
- A. Species
- B. Grades
- C. Sizes
- D. Cuts
- E. Identification
- F. Moisture content
- G. Uses
- H. Strengths
- I. Post/column

3.2 Wood Sidings
- A. Plywood
- B. Chip board
- C. Flake board
- D. Particle board
- E. H.D.O.
- F. LBR core
- G. Grades
- H. Identification
- I. Uses

3.3 Beams/Girders-Wood
- A. Milled
- B. Laminated
- C. Wood & Beam (mfg.)
- D. Combo

3.4 Truss Wood
- A. Floor
- B. Header
- C. Roof
- D. Composite
- E. Nomenclature (type and part)

3.5 Beam/Girder-Steel
- A. Size
- B. Type
- C. Weights
- D. Uses
- E. Post
- F. Header/Lintel

3.6 Fasteners
- A. Brads
- B. Nails
- C. Spikes
- D. Screws
- E. Lags
- F. Bolts
- G. Rivets
- H. Expanding fasteners
- I. Toggle
- J. Connecters
- K. Plates
- L. Pockets
- M. Anchors
- N. Adhesives
- O. Staples
- P. Studs
- Q. Pins
- R. Poured/Plugged

3.7 Concrete
- A. Standard
- B. Lite weight
- C. Mixes
- D. Strengths
- E. Finishes
- F. Pumped
- G. Poured in place
- H. Tilt up
- I. Reinforced

3.8 Reinforcement
- A. Re-bar
- B. Mesh
- C. Web
- D. Anchors
- E. Fiber
- F. Horizontal
- G. Vertical

3.9 Roofing
- A. Composition
- B. Build up
- C. Shingles
- D. Shakes
- E. Wood
- F. Metal
- G. Slate
- H. Clay
- I. Masonry
- J. Appropriate

4.0 DRYWALL

4.1 Standard
4.2 Type X
4.3 W/R
4.4 Corners
4.5 Tape
4.6 Edge finish
4.7 Mud types

5.0 MATERIALS HANDLING

5.1 Lumber
5.2 Plywood

6.0 FLOOR FRAMING

Objectives for the student

From a blueprint or instructor direction:

6.1 Be able to select the correct material for the project.
6.2 Be able to select the correct tool(s) to assemble the project.
6.3 Show competence in completing the project in a safe manner.

6.4 Joist system
- A. Anchor bolts
- B. Sill seal
- C. Termite shield
- D. Mudsill
- E. Girder
- F. Header joist
- G. Stringer Joist
- H. Bridging joists
- I. Blocking
- J. Framing for openings
- K. Subfloor
- L. Building codes

6.5 Post and Beam
- A. Posts
- B. Beams
- C. Vapor barriers
- D. Ventilation
- E. Access holes
- F. subfloor
  - 1. T & G
  - 2. Plywood
- G. Building codes

6.6 Wall Framing
- A. Sole plate
- B. Top plate
- C. Regular stud
- D. Trimmer stud
- E. Cripple stud
- F. Headers
- G. Corner assembly
- H. Intersecting partition Assembly
- I. Rough openings
- J. Bracing
  - 1. Let-in
  - 2. Set-in
- K. Metal strap
- L. Sheathing
- M. Partitions
- N. Drywall nailers
- O. Building codes

7.0 JOB SITE VISIT

Students will visit a residential job site during the rough framing phase.

PROJECTS

1. Build a section of post and beam framing.
2. Frame a floor joist system from blueprint.
3. Frame a wall system from blueprints.

INTRODUCTION TO ELECTRICAL/MECHANICAL TRADES: PART I

BCT 3.202
5-Week Course

5 Credits/week
5 Lecture/week
15 Lab/week
100 Clock

BUILDING CONSTRUCTION
TECHNOLOGY

COURSE CONTENT GUIDE

Prepared by Ray Sytsma

GOALS OF THIS OUTLINE OF COURSE MATERIAL

1. For the student to get as broad a picture of the electrical trades as possible and allow her to properly evaluate, as a career.

2. Present the student with information that will be useful, even if she choose not to be involved in the electrical trades.

3. Determine the areas covered and the depth and degree of coverage.

4. So design as to let the instructor be the prime source of information. References, tests, grading and course materials are not part of this guide.

COURSE HOURS

1.	Materials Familiarization	10
2.	Tools Used and Identification	10
3.	Conductors	8
4.	Electrical Terms	10
5.	Electrical Laws and Regulations, Licensing	8
6.	Basic Electricity: Concepts, Units, Meters and Instruments	10
7.	Conduit and Raceways	10
8.	Schematic Symbols	20
9.	Electrical Safety Practices	10
10.	Basic Wiring: Lighting and Switching	20
11.	National Electric Code, Article 100, Definitions	8
12.	National Electric Code, Article 110, General	8
13.	National Electric Code, Article 300, General	8
14.	Appliances and Types of Appliances: N.E.C., Article 422	20
15.	Motor and Control Concepts	10
16.	D.C. Theory, Basic	20
17.	A.C. Theory, Basic	30
18.	Basic Electronics: Gaseous and Solid State Devices (Demonstration)	4
19.	Hazardous Areas	8
20.	Electric Motor Basics	10

JOB SITE VISITATION

A.	Residential, 2 trips and critiques	8
B.	Commercial, 2 trips and critiques	8
C.	Industrial Plant, 2 trips and critiques	16

APPROXIMATE COURSE HOURS DIVISION

Classroom Study, Lectures and Demonstrations	120
Laboratory Work, Hands on	94
Job Site Visitations	32
Total	246

INSTRUCTIONAL UNIT (1)

I. Objective

To establish a common vocabulary of electrical terms and names of materials. To reach a point, as soon as possible, where a common language of electrical terms and electrical vocabulary exist, between instructor and student.

II. Method

Display of materials, explanation by instructor, and material handling and questions by student.

1.0 Conductors

- 1.1 Wire, solid and stranded. Method of sizing (AWG) Ref. Tables, National Electrical Code, Chapter 9.
- 1.2 Bus and bus bars
- 1.3 Insulation types TW, THW, etc.

2.0 Cables

- 2.1 NMC
- 2.2 MI
- 2.3 MC
- 2.4 AC
- 2.5 S.E. Cable
- 2.6 USE

3.0 Raceways

- 3.1 EMT
- 3.2 PVC
- 3.3 Rigid
- 3.4 Rigid IMC
- 3.5 Wireway
- 3.6 Flexible metallic raceway

4.0 Fittings

4.1 Bushings, locknuts

4.2 Support fittings, straps, etc.

4.3 Hangars

5.0 Boxes

5.1 Conduit boxes

5.2 Cable boxes

5.3 Specialty (large boxes)

6.0 Panelboard switches

6.1 Breaker panel

6.2 Fuse panel

6.3 Cartridge fused switch

6.4 Plug fused switch

7.0 Fuses

7.1 Purpose

7.2 Cartridge fuses: 250 volts, 600 volts

7.3 Plug fuses

7.4 Breakers

7.5 GFCI breaker

8.0 Controllers

8.1 Magnetic across the line starter

8.2 Pressure switches

8.3 Push button station

9.0 Motors

9.1 1 0 motors

9.2 3 0 motors

WORK SHEET QUESTIONS

WIRING MATERIAL

1. Electrical conductors are generally composed of _____ or _____.

2. Non-metallic sheathed cable finds greater use for what type of buildings?

3. List three insulation types.

4. List three metallic raceways.

5. Compare N.M.C. to raceways. List possible advantages of one or both.

WORK SHEET QUESTIONS

6. Why and where are bus bars used?

7. is S.E. Cable permitted outdoors?

8. Does the type insulation determine conductor operating temperature range?

9. Where would you find bus bars in a residential electrical installation?

10. U.S.E. can be used for _____ where other conductors cannot.

INSTRUCTIONAL UNIT (2)

ELECTRICAL TOOLS: USE AND IDENTIFICATION

I. Objective

To allow the student to obtain a basic understanding of proper tool use, and to establish a basic tool vocabulary.

II. Method

Lecture and hands on. After each tool has been demonstrated, the student should be allowed to handle and use each tool in a variety of ways.

1.0 Measuring tools

1.1 Folding rules and steel tapes. &Use in scaling blueprints, layout of locations, measuring cable and conduit.

2.0 Threading tools

2.1 Taps. Drilling and tapping in metal and cleaning threads.

2.2 Dies. Threading bolts and rods. Threading conduit.

2.3 Cleaning threads.

3.0 Adjustable wrenches

3.1 Right method of applying torque in rotation away from stationary jaw.

3.2 Demonstration of possible uses.

3.3 Care of adjustable wrenches.

4.0 Screwdrivers, flat blade.

4.1 Flat blade screwdriver.

4.2 Proper size to fit slotted screw.

4.3 Demonstration of proper regrinding.

4.4 Do not use wrench or pliers to increase torque.

4.5 Do not use as chisel.

5.0 Screwdrivers, Phillips head

5.1 Selection of proper size for tightening or loosening screws, lugs and other phillips heads.

5.2 Do not use wrench or pliers to increase torque.

6.0 Six in one tool (terminal tool)

6.1 Demonstrate insulation stripping with tool.

6.2 Demonstrate conductor cutting, small sizes.

6.3 Demonstrate cutting of small bolts to maintain a useable thread.

6.4 Demonstrate use in crimping small splicing devices and terminals.

7.0 Slip joint pliers (gas pliers)

7.1 Demonstrate "limited" use for holding and tightening.

7.2 Explain why use should be limited.

8.0 Needle nose pliers (long nosed)

8.1 Demonstrate use in forming small conductors.

8.2 Demonstrate cutting of small conductors.

8.3 Use in tight places.

9.0 Diagonal cutting pliers (dikes)

9.1 Demonstrate use for cutting small conductors.

9.2 Demonstrate use in stripping insulation.

10.0 Lineman's pliers (side cutters)

10.1 Demonstrate cable and conductor cutting.

10.2 Demonstrate forming of conductors.

10.3 Demonstrate twisting and splicing of conductors.

11.0 Electricians hammer

11.1 Demonstrate use in driving and pulling nails.

11.2 Demonstrate use of claw for chipping wood, plasterboard and other materials.

12.0 Pocket knife (electricians knife)

12.1 Demonstrate use as a stripping tool for large conductors.

12.2 Demonstrate use as a cutting tool, emphasis on use to avoid injury, never use as a pry.

12.3 Demonstrate sharpening technique.

13.0 Test light (neon)

13.1 Demonstrate use as voltage indicator.

13.2 Demonstrate care in use to avoid contacting of bare conductor and resulting shock.

14.0 Large slip joint pliers (pump pliers, channel lock pliers).

14.1 Demonstrate use in holding and tightening locknuts, bushings, conduit, etc.

14.2 Keep hinge joint tight.

15.0 Awl (scratch awl)

15.1 Demonstrate starting screws.

15.2 Explain danger of improper carrying method.

Suggested text:

"Wiring Simplified" by H.P. Richter, 32 Ed., 1977.
Pork Publishing Co.

WORK SHEET QUESTIONS

TOOLS

1. Would you use side cutting pliers to cut hard steel wire?

2. Explain how you would grip side cutting pliers, and how are they opened?

3. Describe a proper point for a flat blade screwdriver.

4. An electrician's hammer should have _____ claws.

5. What type plier would you use to form and "eye" for a binding screw in #14 copper?

WORK SHEET QUESTIONS

6. What are the six uses for a six-in-one tool?

7. With a hack saw blade properly installed, which way do the teeth slant?

8. What tool does an electrician use to remove the insulation from large conductors?

9. List as many uses you can think of, that the electrician would have for large slip-joint pliers (channel locks, "pump" pliers).

10. Would you say that "bargain basement"type tools would be a good investment as compared to high quality tools? Why?

INSTRUCTIONAL UNIT

CONDUCTORS

Objective: To obtain a fundamental understanding of the many types of conductors and insulation.

Method: Lecture, display of conductor types. National Electric Code and Job Sheets.

1.0 Solid (copper wire and cable conductors)

- 1.1 Sizing A.W.G. NEC
- 1.2 Ampacities NEC
- 1.3 Limitations
- 1.4 Insulations

2.0 Aluminum conductors

- 2.1 Comparison to copper
- 2.2 Relative ampacities
- 2.3 Limitations
- 2.4 Insulations

3.0 Bus bars

- 3.1 Copper
- 3.2 Aluminum
- 3.3 Ampacities

WORK SHEET QUESTIONS

CONDUCTORS

1. Aluminum has_____% of the conductivity of copper.

2. The symbol for copper used on terminations is _____.

3. 15 and 20 ampere wiring devices suitable for use with aluminum and copper are marked ___and___ .

4. As used in the N.E.C., the work "covered", in reference to conductor covering, means:

5. The American Wire Gauge System is used for sizing conductors. What difference in gauge numbers indicates a doubling of size?

6. Aluminum bus bar has a maximum allowed ampacity of _____ amperes per inch of cross sectional ares.

7. The maximum allowed ampacity for copper has is _____ amperes per inch of cross section.

8. The type letters for a certain wire insulation has two H's as THHN. What temperature rating is indicated?

9. One H in the insulation type letters indicates a temperature rating of _____ degrees C.

10. What is a circular mil?

INSTRUCTIONAL UNIT

TERMS AND DEFINITIONS

Objective: The electrical terms are part of the electrical language. It is essential that the student understand and be able to converse in this language.

Method: Lecture, film and/or film strips.

1.0 Volt

- 1.1 Definition
- 1.2 Pressure A.C. or D.C.

2.0 OHM

- 2.1 Definition
- 2.2 Measures unit of resistance or impedance

3.0 Ampere

- 3.1 Definition
- 3.2 Electron flow or drift through conductor

4.0 D.C. current

- 4.1 Current flow in one direction
- 4.2 Pulsating D.C.
- 4.3 Steady voltage of D.C. current (not pulsating)

5.0 A.C. current

- 5.1 Alternations
- 5.2 Cycle (2 alternations)

6.0 Power (rate of work)

- 6.1 Definition
- 6.2 Watt unit of power measurements

7.0 Conductor

7.1 Definition and purpose
7.2 Sized AWD
7.3 Table 8, Chapter 9, National Electrical Code

8.0 Insulator

8.1 Definition
8.2 Types (glass, ceramic, neoprene, etc.)

9.0 Overcurrent devise

9.1 Definition
9.2 Devices to protect against overcurrent (fuses, breakers)

10.0 Circuit

10.1 Definition
10.2 Intended
10.3 Accidental, ground fault or short circuit

11.0 Series circuit

11.1 Definition

12.0 Parallel circuit

12.1 Definition

13.0 Thermostat

13.1 Definition
13.2 Types (open on rise, close on rise)

14.0 Ground

14.1 Definition. Circuit to earth or equipment connected to earth

14.2 Accidental
14.3 Intentional
14.4 Type
- a. Equipment
- b. System
- c. Service

WORK SHEET

ELECTRICAL TERMS

Match terms by connecting with a ruled line.

1.	Volt	Rate of flow
2.	Kilowatt	Overcurrent device
3.	Kilowatt hour	THW
4.	Conductor	Power
5.	Auxiliary gutter	"Rigid"
6.	Ampere	Has a hinged or removable cover
7.	Fuse	Pressure
8.	OHM	1,000 watts for 1 hour
9.	Horsepower	Tubing
10.	Watt	N.M.C.
11.	Insulator	Ceramic, glass, etc.
12.	Circuit breaker	May also serve as a switch
13.	Conductor insulation	"Flex-steel"
14.	Conduit	1,000 watts
15.	E.M.T.	Cycles per second
16.	Flexible metal conduit	Designed as a low resistance path of current flow
17.	Hertz	746 watts
18.	Non-metallic sheathed cable	Resistance

INSTRUCTIONAL UNIT

OREGON STATE ELECTRICAL SAFETY LAWS AND LICENSING REGULATIONS

Objective: For the student to become familiar with safety laws and regulations, and understand the necessity for these laws for the public safety. Most areas of the United States have regulations similar to Oregon laws.

Method: Lecture and explanation, work sheets (copy of laws as study texts).

1.0. Basic Laws, O.R.S. No.

- 1.1 Permit system
- 1.2 Inspections
- 1.3 Responsibilities
- 1.4 Violations and penalties

2.0 Licensing Laws, O.R.S. No.

- 2.1 Types of licenses
- 2.2 Limitation of each license
- 2.3 Responsibilities

3.0 Consumer Protection

- 3.1 Product safety
- 3.2 Inspections, compliance
- 3.3 Responsibilities for product approval
- 3.4 Violations and penalties

WORK SHEET QUESTIONS

1. May an owner install wiring on property he owns, that is not intended for sale, rent or lease?

2. What are the limitations of a limited journeyman's license?

3. Is a member of a corporation considered to be an owner under these rules?

4. Does an electrical contractor have to be a licensed journeyman or supervisor?

5. What experience is necessary to qualify for the general journeyman's examination?

WORK SHEET QUESTIONS

6. Can electrical work be performed by contractors without providing for permits and inspections?

7. Are electrical inspectors required to be licensed electricians?

8. What types of electrical installations can be made by a general journeyman?

9. What are the limits of an apprentice's license?

10. How is the electrical safety law administered in Oregon?

WORK SHEET QUESTIONS

ELECTRICAL LAWS AND REGULATIONS

1. At present, with what states, and what category of licenses, does Oregon have reciprocity agreements?

2. How is the National Electric Code adopted and?or amended in Oregon?

3. How often are tests given for journeyman licenses? For general supervisors' licenses?

4. What is the maximum penalty for making electrical installations without being licensed?

5. Would this be a true statement: "Oregon Laws and Regulations presumes all electrical products are safe unless proven otherwise."

WORK SHEET QUESTIONS

6. What is the reason for "licensing" of electricians?

7. Are cities (municipalities) allowed to "administer and enforce" electrical safety laws?

8. Can cities maintain an inspection and permit program?

9. The licensing period for supervisors is _____ years.

10. Must licensed electricians continue with their electrical educations, after receiving a license?

INSTRUCTIONAL UNIT

BASIC ELECTRICITY CONCEPTS

Objective: Student to gain a knowledge of terms and meanings. At this point, detailed information is not desirable. Concepts, not theory, is the goal.

Method: Lecture, demonstration. Later units will provide greater detail and hands on.

1.0 Electricity
- 1.1 Flow of electrons
- 1.2 Ampere, rate of current flow.
- 1.3 Coulomb, measure of quantity (not in general use).

2.0 Pressure
- 2.1 Volts
- 2.2 Water analogy
- 2.3 Insulation, voltage ratings.

3.0 Resistance
- 3.1 OHM
- 3.2 Difference between resistors and insulators.
- 3.3 Water (analogy useful)

4.0 Voltmeter
- 4.1 Demonstrate meter use for voltage measurement.
- 4.2 Low voltage, chime transformer
- 4.3 Higher voltage, line voltage 120/240, 480 etc.
- 4.4 High voltage, neon sign transformer's. (example)

5.0 Ohmmeter and Meggers
- 5.1 Measurement, demonstration
- 5.2 Very low resistance, conductors
- 5.3 Higher resistance, resistors
- 5.4 Extremely high resistance insulator
- 5.5 Demonstrate ohmmeter and meggar as examples of measuring resistance and insulation.

WORK SHEET QUESTIONS

BASIC ELECTRICITY CONCEPTS

1. What is electricity?

2. How are insulators different from conductors?

3. What kind of instruments are used to measure electricity?

4. What is a resistor?

5. What is the difference between an ohmmeter and a "Megger"?

6. Name as many forms of energy as you can, that can be obtained by conversion of electrical energy.

7. Define "static: electricity.

8. Electricity can kill. Does it have to be a very high voltage?

9. Using water for comparison, what electrical term would equate with gallons per minute?

10. Using the water analogy, what electrical term would equate with pounds per square inch?

INSTRUCTIONAL UNIT

CONDUIT AND RACEWAYS

Objective: Provide basic understanding of conduit and raceways, types and typical uses.

Method: Demonstration by instructor and examination by students.

1.0 Electrical metallic tubing (EMT), N.E.C. Article 348

1.1 Advantages

1.2 Ease of handling

1.3 Limitations

a. Not for some hazardous areas.

b. Corrosion susceptibility.

2.0 Intermediate metal conduit (I.M.C.), N.E.C. Article 345

2.1 Advantages. Combines some of advantages of E.M.T. and rigid conduit.

2.2 Uses

2.3 Limitations

a. Does not have great strength of rigid.

3.0 Rigid metal conduit, N.E.C. Article 346

3.1 Advantages (great strength), resistance to mechanical damage.

3.2 Longevity of raceway under adverse conditions.

3.3 Disadvantages, heavier.

4.0 Wiremold, N.E.C. Article 352

4.1 Surface method not as unsightly as other conduit raceways.

4.2 Adaptable, can be used in combination with existing systems.

4.3 Ease of installation.

5.0 Flexible metal conduit (Flex), N.E.C. Article 350

5.1 Advantages

a. Flexibility

b. Ease of installation

c. Wide range of uses

5.2 Disadvantages

a. Limitations of use.

b. Necessity of using equipment ground.

6.0 Wireways, N.E.C. Article 362

6.1 Versatility and adaptability

6.2 Ease of installing conductors

6.3 Less use of boxes

7.0 Gutters, N.E.C. Article 374

7.1 Use load center, service and control center

7.2 Limitations

a. Length and areas of installation

7.3 Advantages

a. Versatile, splice point and junction point.

WORK SHEET

CUTTING, THREADING AND REAMING OF RIGID CONDUIT

1. Cutting of conduit to length

   a. Proper use of cutting tools

   b. Reaming

   c. Threading, length of thread, lubricating of dies.

   d. Use of threading machine or power threading.

   e. Coupling of threaded conduits.

   f. Proper use of slip joint pliers, small pipe wrench and rule.

2. Cut, ream and thread

   a. 1/2" - 30 inches long

   b. 3/4" - 10 inches long

3. Install 30" length with locknuts and bushings between two 4/0 outlet boxes.

4. Couple 10" length and 30" length with coupling.

INSTRUCTIONAL UNIT

COMMON SCHEMATIC SYMBOLS AND DEFINITIONS

Objective: Schematic symbols are a written language of the electrical trades. It is necessary that the student be able to speak and understand this language.

Method: Lecture and demonstration, student hands on work with schematics as guided by instructor.

1.0 Transformers

1.1 Purpose

2.2 Types

a. Auto

b. Distribution (voltage)

c. C.T.'s, current transformers

2.0 Switches and contacts

2.1 Single pole

2.2 Multi-pole

3.0 Relays

3.1 Line voltage control

3.2 Low voltage control

3.3 Latching relays

3.4 Normally open

3.5 Normally closed

4.0 Fuses

4.1 Definition

4.2 One time

4.3 Time delay

5.0 Resistors

5.1 Definition

5.2 Fixed

5.3 Variable

6.0 Inductors

6.1 Definition

6.2 Fixed

6.3 Variable

7.0 Connections

7.1 Terminal

7.2 Splices

7.3 Crossovers

7.4 Ground connectors

8.0 Wiring devices

8.1 Definition

8.2 Receptacles

8.3 Switches

a. S.P.

b. 3-way

c. 4-way

9.0 Motors

9.1 Definition

9.2 D.C. universal

9.3 1 0 A.C.

9.4 3 0 A.C.

INSTRUCTIONAL UNIT

ELECTRICAL SAFETY, BASIC

Objective: Learning of those special safety practices that are peculiar to the electrical trades.

Method: Lecture and demonstration (many good films are available)

1.0 Lethal currents

1.1 High voltage not necessary to be lethal.

1.2 120 volt causes most fatalities.

1.3 25-50 volts has caused electrocution under certain circumstances.

1.4 Deep body out of current flow. Do not allow body to be a conductor.

2.0 Grounding

2.1 Normal system and equipment grounding.

2.2 Safety, grounding

a. Grounding and bonding to prevent accidental energizing during repair, maintenance or installation.

2.3 Energized equipment

a. Never remove a grounding conductor, unless an alternate ground path is first provided.

3.0 Tagging procedures

3.1 Use proper procedures. Do not deviate or short-cut.

3.2 Nobody can protect you, except you.

4.0 Check and recheck for presence of voltage.

4.1 Make sure indicating device is working properly.

4.2 Never work "hot" circuits. Rarely is it necessary.

5.0 Use safe practices with ladders and scaffolding (covered in other units).

6.0 Ground fault circuit interrupters as safety devices.

a. Principle of operation.
b. Where required. N.E.C. article 210-8.

7.0 Color coding of safety tags in signs.

7.1 "DO NOT START" tag.

a. White tag.
b. White letters on red square.

7.2 "CAUTION" tag

a. Yellow tag.
b. Yellow letters on black background.

7.3 "DANGER" tag.

a. White tag.
b. White letters in red and on black square.

7.4 "OUT OF ORDER" tag.

a. White tag.
b. White letters on black background.

8.0 Safety practices for electrical tools.

8.1 Each tool should have proper guard where required for safety.

8.2 Eye protection should always be worn.

8.3 Be sure tool is properly grounded or double insulated.

9.0 Major causes of electrical accidents.

9.1 Carelessness

9.2 Ignorance

9.3 Horseplay

Before a person engages in operation of any equipment or job procedures, it is <u>most</u> necessary to be totally knowledgeable as to the safe procedures and methods. This listing is only partially complete. Equipment can be replared and, when compared to people, is expendable. People are "not expendable" and cannot be duplicated. There will never be another <u>you</u>.

WORK SHEET QUESTIONS

ELECTRICAL SAFETY

1. Rubber soled shoes are an acceptable method of protections, when handling live wires. True or False?

2. Will faulty or hazardous (grounded or shorted) tools always blow a fuse or trip a breaker?

3. You have been told, "That circuit is dead". What would your reaction be?

4. How would you help your partner, who has just come in contact with an energized conductor and is being electrocuted?

5. Some people are immune to electrical shock. Do you think so?

6. Could you be severely injured by an electrical shock, because it made you jump?

7. Jumpering a fuse can be justified if the reason for its repeated blowing is not determined. What do you think?

8. Rules are made to be broken in some situations. Would you apply this to electrical safety rules?

9. Why follow a precise safety rule, when you can think of several equally good ways to do the same thing? Give your reasons.

10. An old cliche says, "When working around electrical equipment, keep one hand in your pocket". Of course, it isn't always possible, but why would it otherwise be a good rule?

INSTRUCTIONAL UNIT

BASIC WIRING

Objective: Give the student hands on experience with fundamental wiring circuits (residential, NMC).

Method: Student assembles simple circuits under instructor guidance, using mock up of boxes and cable, emphasizing proper splicing and terminations.

1.0 Light outlet and single pole switch

a. Proper stripping of cable.

b. Service cable properly to boxes.

c. Remove insulation from conductor, using proper tools.

2.0 Light outlet and three way switches

a. Assemble using proper methods, as in above.

b. Troubleshoot to find simulated (bugged) problem.

3.0 Two light outlets, three way switches

a. Assemble correctly, as above.

b. Trouble shoot simulated faults (bugged).

4.0 Two lights, three way switches and receptacle outlet.

a. Assemble, as in 1 and 2, above.

b. Troubleshoot simulated faults, after assembly.

5.0 Power, "watts", "P"

5.1 Unit of measurement of electrical work.

5.2 Definition.

5.3 Use of power triangle:

a.

b. $P = E \times I$

c. $E = \frac{P}{I}$

d. $I = \frac{P}{E}$

6.0 Demonstration of meter use for voltage measurements.

6.1 Parallel, <u>always</u>.

6.2 Always start on high scale, and change to lower scales until "center reading" approximate.

7.0 Demonstrate meter use for amperage measurement.

7.1 Series <u>never</u> parallel.

7.2 Always start on highest reading scale and change to lower scales until approximate center reading is obtained.

8.0 Demonstrate meter use for measurement of resistance (Ohms).

8.1 Ohmmeter not to be used where circuit is energized.

8.2 Use scale providing as close to "center" reading as possible.

WORK SHEET

TROUBLE SHOOTING OF BRANCH CIRCUITS

Objective: To allow student to get the feel of putting basic knowledge of circuits to work as would be done in the field.

Method: Set up of breaker (or fuse), single pole switch light and receptacle. Instructor "bugs" the setup:

1) Bad fuse or breaker

2) Bad lamp

3) Bad switch

4) Open conductor

5) Short circuit

6) Faulty receptacle

1.0 Use of test meter or neon lamp to determine presence of voltage.

2.0 Use of ohm meter to determine continuity.

"Bugs": 1) Install cellophane tape around end of conductor terminating on fuse or breaker.

2) Cellophane tape on center terminal of lamp.

3) Use 250 volt lamp on 120 volts.

INSTRUCTIONAL UNIT

NATIONAL ELECTRIC CODE ARTICLE 100

Objective: Introduction to the National Electric Code and use.

Method: Lecture and class study of Article 100.

1.0 Article 100 Definitions

- 1.1 General terms
  - a. Circuits
- 1.2 Grounding
- 1.3 Bonding

2.0 Specific terms

- 2.1 Overcurrent devices
- 2.2 Voltages
- 2.3 Disconnects
- 2.4 Devices
  - a. Receptacles
  - b. Outlets
  - c. Devices

WORK SHEET QUESTIONS

ARTICLE 100, NATIONAL ELECTRIC CODE

Paraphrase code definitions, using your own words.

1. What is a branch circuit?

2. What is "accessible" as it refers to equipment?

3. What is a "ground"?

4. What is a receptacle?

5. What is a receptacle outlet?

6. What is a series drop?

7. What is the N.E.C. meaning of "voltage of a circuit"?

8. What does the term "explosion proof" mean?

9. Would an Underwriters Label on an appliance cord indicate that an appliance met their standards? Why?

10. What is a feeder?

INSTRUCTIONAL UNIT

NATIONAL ELECTRIC CODE, ARTICLE 110

Objective:Familiarization with National Electric Code and use.

Method: Lecture, class study of National Electric Code, discussion and Job Sheets.

1.0 General

1.1 National Electric Code 110-1 through 110-8.

2.0 Wiring methods and installation requirements.

2.1 National Electric Code 110-9 through 110-14.

3.0 Safety

3.1 National Electric Code 110-16 through 110-34.

WORK SHEET QUESTIONS

NATIONAL ELECTRIC CODE, ARTICLE 110

1. Does Article 110 of the N.E.C. apply to all systems, except low voltage systems? Why?

2. Article 110-12 says that all work must be done on a "neat and workmanlike manner". What, exactly, does this mean to you? Can you apply an exact standard?

3. Article 110-16 requires a minimum "work space". Give your reasons why this is required.

4. I have developed a new wiring method and it is thought to be a very good one. What must happen before I can use it, under N.E.C. rules?

5. The minimum headroom required in working spaces is _____ feet, _____ inches.

INSTRUCTIONAL UNIT

NATIONAL ELECTRIC CODE, ARTICLE 300

Objective: To acquaint the student with the National Electric Code as a safety requirement. Does not establish design. Establishes safety parameters.

Method: Lecture, classroom study and discussion.

1.0 Installation methods (underground)

- 1.1 Burial depth of underground
- 1.2 Backfill
- 1.3 Protection of conductors

2.0 Installation methods in structure

- 2.1 Protection of conductors and cable
- 2.2 Securing and supporting
- 2.3 Electrical continuity
- 2.4 Mechanical continuity

3.0 Boxes and fittings

- 3.1 Where required
- 3.2 Not required on
- 3.3 Use of conduit boxes

4.0 Conductors in raceways

- 4.1 Limit of number
- 4.2 Limit of size
- 4.3 Vertical support

5.0 Prevention of spread of fire

- 5.1 Purpose of firestops
- 5.2 Where necessary
- 5.3 Alternate methods

6.0 Prevention of spread of toxic fumes

- 6.1 Conductor insulation types
- 6.2 Raceway types
- 6.3 Prohibits installations in environmental air transfer system.

WORK SHEET

NATIONAL ELECTRIC CODE, ARTICLE 300

1. What is the reason underground conductors have minimum burial depth requirements?

2. Does the N.E.C. allow other cables or raceways to be supported from an existing raceway?

3. If I must install conductors in a long vertical raceway, does the N.E.C. require any method of supporting the conductors?

4. How must conductors emerging from the earth and subject to physical damage be protected, as required by the N.E.C.?

5. Can a buried conductor be spliced, without the splice being in a box?

INSTRUCTIONAL UNIT

APPLIANCES

Objective: Student familiarity with range of household appliances and fundamentals of operation.

Method: Lecture, demonstration and hands on repair.

1.0 Motor operated appliances

1.1 Washers, garbage disposals,etc.

1.2 Mixers, hand tools, drills and saws.

1.3 Control and disconnect requirements. N.E.C. Article 422.

2.0 Heating appliances

2.1 Portable

2.2 "Fastened in place" baseboard central heating.

3.0 Lighting appliances

3.1 Portable lamps, table and floor

3.2 Trouble lamps

3.3 Install cords, switches and lamp holders under instructor guidance.

4.0 Water heaters

4.1 Control

a. Modulating control

b. Non-modulating control

4.2 Examine, remove thermostats, heating elements and replace.

WORK SHEET

APPLIANCES

1. Student should disassemble, test, and reassemble a simple major appliance, such as

    a. Water heater

    b. Portable heater

INSTRUCTIONAL UNIT

MOTOR CONTROL CONCEPTS

Objective: Student to become acquainted with motor control concepts and recognize there are safety parameters.

Method: Lecture, hands on of simple control circuits, and demonstration.

1.0 Disconnect switch control

1.1 Start-stop.

1.2 Limitations, must be directly operated.

1.3 Size and current limitations.

2.0 Relay control

2.1 Across the line starter type, two wire control.

2.2 More versatile for complex systems.

2.3 Advantages of current handling capability.

3.0 Overload concepts

3.1 Purpose of overloads.

3.2 Why both overloads and fuses or breakers are necessary.

4.0 Controls, proper sizing

4.1 Relationship of H.P. Rating to controls

4.2 Relationship of H.P. rating to size disconnects. Brief reference to N.E.C. Article 430-52 and 53 and 430-152.

5.0 Small motors (Appliances)

5.1 Toggle switch control

5.2 Cord cap and receptacle control

5.3 Unit switch control, vacuum cleaners, mixers and other household appliances.

INSTRUCTIONAL PRINCIPLES USED FOR BASIC D.C. AND A.C. THEORY

1. No attempt is made to make the student a "learned expert" in electrical theory.

2. The student should make a serious effort to understand each new piece of information as it is presented. On the other hand, we cannot expect to be successful in every case. Sometimes a seasoning process seems necessary, whereby the information takes on meaning with the passage of time. We become more convinced of the truth and usefulness of information with the passage of time. A famous psychologist said"We seem to learn to swim in the winter time and ice skate in the summer". Rather than to be discouraged if this new information seems too difficult, sleep on it, let it grow with time.

   A great French mathematician said, "Go on and faith will follow you". So it is with electrical theory. These instructional units will serve as a <u>first</u> exposure.

INSTRUCTIONAL UNIT

BASIC THEORY: D.C.

Objective: To obtain an understanding of Ohms Law, Kirckoffs Laws, and Power Formulas. A "first" exposure to these fundamentals.

Method: Lecture and demonstration.

1.0 Volt "E"

1.1 Unit of measurement for pressure or

1.1 Unit of measurement for pressure or potential difference.

1.2 Definition.

2.0 Ohm "R"

2.1 Unit of measurement of resistance or opposition to current flow.

2.2 Definition.

3.0 Ampere, "AMP", "I".

3.1 Measurement unit of rate of flow not representative of quantity unless time also considered.

3.2 Definition.

3.3 Coulomb (rarely used term) represents quantity (use of water analogy to illustrate).

4.0 Relationship of volt, ohm and ampere.

4.1 Ohms Law

4.2 Use of Ohms law triangle:

a. $E = I \times R$

b. $I = \frac{E}{R}$

C. $R = \frac{E}{I}$

BASIC TRADES BUILDERS MATH
BCT 3.129

2 Credits
2 Lecture
0 Lab
12 Week
20 Clock Hours

COURSE CONTENT GUIDE

Prepared by
Bob Wolever

I. INTRODUCTION

The purpose of this course is to expose the student to basic math commnly used in the normal work day of the builder. It also will serve to acquaint the student to the nomenclature phrases and language of another trade/occupation.

II. PREREQUISITES

Being able to do the most rudimentary functions of addition, subtractions and multiplication. and being able to understand the appropriate language.

III. REQUIRED EQUIPMENT

1. Textbook
   "Practical Problems in Mathmatics for Carpenters"
   Delmar Publishing Co.

2. Notebook, tablet and pencil.
3. Calculator is optional.

IV. COMMENTS ON COURSE

The student will be exposed to the mathmatical calculation of the following problems of estimation.

A. Linear accumulation
B. Various surface areas
C. Various configurations of volume
D. Decimals
E. Fractions
F. Square inch
G. Square feet
H. Square yard
I. Squares
J. Cubic inches
K. Cubic feet
L. Cubic yard
M. Board feet to $
O. "Field" squaring corners.

INSTRUCTIONAL GOALS AND OBJECTIVES

Upon satisfactory completion of this course the student will have knowledge of why and how the functions are both necessary and important to the builder. The student will have demonstrated so on a day by day basis. This will make the student of considerable greater value to both themselves and their future as builders.

VI. EVALUATION

Evaluation will be discussed at the out set of the course.

1.0 CONTENT OF COURSE

The following will delineate the problems the student will mathmatically solve. It also gives the appropriate section and or unit location in the text book that show the procedural steps of the function.

(CU.FT. & CU.YD.)

1.1 Earth excavation
- A. Volume
- B. Weight
- C. Cost
- D. Units 19 & 21

(CU.FT. & CU.YD.)

1.2 Backfill plus sand/gravel
- A. Volume
- B. Weight
- C. Cost
- D. Units 19 & 21

(Linear & Number)

1.3 Steel (vertical & flat) anchors
- A. Numbers
- B. Type
- C. Size
- D. Weight
- E. Cost
- F. Unit 18 & 22

(CU.FT. & CU.YD.)

1.4 Concrete
- A. Volume
- B. Weight
- C. Cost
- D. Units 19-20 and 21

(BD.FT.)

1.5 Lumber (see section 9)
- A. Number
- B. Board feet
- C. Cost
- D. Units 18 & 20

(SQ.FT.)

1.6 Sheathing (see unit 42)
- A. Area
- B. Sheets
- C. Cost
- D. Units 18 & 19

(SQUARES)

1.7 Roofing (see unit 45)
- A. Area
- B. Rolls
- C. Bundles
- D. Box
- E. Weight
- F. Cost
- G. Unit 18 & 19

(SQ.FT.)

1.8 Sideing (see unit 43)
- A. Area
- B. Amount
- C. Cost
- D. Unit 19 & 20

(SQ.FT.)

1.9 Panels (see unit 42)
- A. Area
- B. number
- C. Cost
- D. Units 18 & 19

(SQ.FT.)

1.10 Paint
- A. Area
- B. Gallons
- C. Cost
- D. Units 18 & 19

(SQ.FT.)

1.11 Paper (see unit 48)
- A. Area
- B. Rolls
- C. Cost
- D. Units 18 & 19

(SQ.FT. & SQ.YD.)

1.12 Floor Covering (see unit 48)
- A. Area
- B. Amount
- C. Cost
- D. Units 18 & 19

(CU.FT.)

1.13 Insulation
- A. Volume
- B. Amount
- C. Cost
- D. Units 19 & 21

(SQ.FT.)

1.14 Masonry
- A. Area
- B. Units
- C. Weight
- D. Cost
- E. Units 19 & 22

1.15 Percentage
- A. Waste and lap
- B. Unit 15

1.16 Common fractions
- A. Sect. 2

1.17 Decimal fractions
- A. Sect. 3

2.0 PERCENTAGE

The student will be exposed to the calculation of percentages relating to waste and overlaping of certain building materials as follows:

2.1 Siding
2.2 Decking
2.3 Roofing
2.4 Shrinkage
2.5 Swelling
2.6 Appropriate

3.0 The student will be exposed to common fractions encountered on a daily basis in the field of construction and how they are dealt with.

3.1 Units of measurement
3.2 Measuring equipment

4.0 The student will be exposed to decimal fractions encountered ona daily basis in the field of construction and how they are dealt with.

4.1 Units of measurement
4.2 Measuring equipment
4.3 Rods
4.4 Cost

5.0 "Field" squaring corners
    5.1 Square Corners by diagonal measurement.
    5.2 Square conrers by 3-4-5 (or multiple thereof) method.

6.0 With this knowledge at hand the successful student will gain a value based on self worth, confidence and of an employable skill.

ORIENTATION TO VOCATIONAL TRAINING FOR SKILLED TRADES AND INDUSTRY

BCT 3.203

1 Credit
1 Lecture
10 Clock

Building Construction Technology

Course Content Guide
Prepared by Christine E. Jones

DEFINED OUTCOMES

This section is a statement of final learning outcomes and does not attempt to show how, or in what order, the defined outcomes will be presented.

The following factors will influence the students ability to complete the defined outcomes:

Motivation and attendance, speed of mastering the subject matter, and availability of material and/or equipment.

I. PURPOSE

The purpose of this course is to develop an understanding of how certain physical, educational and mechanical skills and aptitudes relate to success in skilled trade and industrial occupations. For this outline the term "vocational education" specifically means vocational training for skilled trades and industry.

II. INTRODUCTION

The student will study those physical and educational skills that relate to success in skilled trade/industrial occupations.

This is a one (1) credit course that meets one hour per week for ten weeks.

Transferability of credit depends entirely upon the institution to which the student wishes to transfer.

The student should contact the Building Construction Department with respect to the cost of materials for this course.

III. COMMENTS ON COURSE ACTIVITY AND DESIGN

The students time is divided between lecture, discussion, and small group work. The student will be given a series of class projects to demonstrate ability to identify the specific educational , physical and situational circumstances that relate to success in skilled trade and industrial occupations.

IV. PREREQUISITE KNOWLEDGE AND SKILLS

None

V. EVALUATION

Evaluation procedures will be discussed during the first class session.

VI. INSTRUCTIONAL GOALS AND OBJECTIVES

This is a topical outline and not necessarily the sequence in which the material will be presented.

1.0 HISTORY

Instructional Goal

The goal is to develop an understanding of the historical role of vocational education in the United States.

Objectives

Given lecture, discussion and small group exercises the student will be able to:

1.1 Write a short essay outlining the important events in the history of vocational education in the United States.

1.2 Describe three reasons why vocational skills training is in demand today.

2.0 TRAINING READINESS

Instructional Goal

The goal is to develop the student's ability to assess her/his personal readiness to benefit from training and plan for completing a program successfully.

Objectives

Given lecture, discussion and small group exercises the student will be able to:

2.1 Describe five important characteristics of a successful vocational student.

2.2 Write a five-step personal plan to finance a training program using college and community resources.

2.3 Select a personal barrier and outline a solution proposal using campus or community resources.

2.4 Describe five major health issues that influence success in vocational careers and make suggestions to diminish risk in each area.

2.5 Write a personal self-assessment addressing both the assets and barriers that he/she brings to a vocational training program and include proposed solutions.

3.0 TRAINING ENVIRONMENT

Instructional Goal

The goal is to develop an understanding of the vocational training environment at Portland Community College.

Objectives

Given lecture, discussion and small group exercises the student will be able to:

3.1 Outline the educational options available through Portland Community College: ABE/ENNL, GED, certificate programs, one and two-year degree programs, transfer programs, apprenticeship training.

3.2 Write a definition of competency-based training and compare such training to the traditional learning situation.

3.3 Write an overview of education-industry partnerships that aid vocational students and give five examples of such partnerships.

TARGETING OCCUPATIONS IN SKILLED TRADES AND INDUSTRY

BCT 3.204

2 Credit
2 Lecture
20 Clock Hours

Building Construction Technology

Course Content Guide
Prepared by Christine E. Jones

DEFINED OUTCOMES

This section is a statement of final learning outcomes and does not attempt to show how, or in what order, the defined outcomes will be presented.

The following factors will influence the students ability to complete the defined outcomes.

> Motivation and attendance, speed of mastering the subject matter, and availability of material and/or equipment.

I. PURPOSE

The purpose of this course is to develop an understanding of how to assess the career occupations available in skilled trades and industry in relation to the student's personal situation. For this outline the term "vocational education" specifically means vocational training for skilled trades and industry.

II. INTRODUCTION

The student will study the particular characteristics of careers in skilled trades and industry that will aid the student in making informed career choices.

This is a two (2) credit course that meets two hours per week for ten weeks.

Transferability of credit depends entirely upon the institution to which the student wishes to transfer.

The student should contact the Building Construction Department with respect to the cost of materials for this course.

III. COMMENTS ON COURSE ACTIVITY AND DESIGN

The student's time is divided between lecture, discussion, and small group work. The student will be given a series of class projects to demonstrate her/his understanding of the characteristics of careers in skilled trades and industry that will influence his/her long term success in those occupations.

IV. PREREQUISITE KNOWLEDGE AND SKILLS

Students admitted to this course must have satisfactorily completed BCT 3.203, ORIENTATION TO VOCATIONAL TRAINING FOR SKILLED TRADES AND INDUSTRY.

V. EVALUATION

Evaluation procedures will be discussed during the first class session.

VI. INSTRUCTIONAL GOALS AND OBJECTIVES

This is a topical outline and not necessarily the sequence in which the material will be presented. For this outline the term "vocational education" specifically means vocational training for skilled trades and industry.

1.0 APPRENTICESHIP AND TRAINING

Instructional Goal

The goal is to develop an understanding of training opportunities available in skilled trades and industry and the importance of researching those opportunities realistically in terms of individual circumstances.

Objectives

Given lecture, discussion and small group exercises the student will be able to:

1.1 Prepare a hierarchial diagram that illustrates the relationship of Federal, State and local agencies that administer apprenticeship in Oregon.

1.2 Define the acronym: JATC, TA, DOL, BAT, BOLI, PR

1.3 Write a one-page overview of a selected apprenticeship program which includes the DOT code and a summary Standards and Scope of Work.

1.4 Write a brief description of one state certified apprenticeship program and include information on minimum entry requirements, selection method, starting wage, length of training, and work processes.

1.5 Define the term "rerate" and compare work hours and corresponding rerate periods for two selected apprenticeship programs.

1.6 Prepare a five-step plan for making application to a selected apprenticeship program beginning with the "opening announcement", including the "selection method", and "minimum requirements", and ending with signing the "log" and receiving an "Intent to Hire", if appropriate.

1.7 Write an essay in which she/he contrasts and compares apprenticeship training with two traditional training methods.

2.0 TRANSITORY WORK ENVIRONMENTS

Instructional Goal

The goal is to develop an understanding of the elements of the work environment that are specific to skilled trades and industry.

Objectives

Given lecture, discussion and small group exercises the student will be able to:

2.1 Write a definition of "traditional work"

2.2 Describe five important characteristics of the skilled trade work environment that differentiate the environment from the traditional.

2.3 Describe a work situation that illustrates a specific transitory worksite problem and its solution.

2.4 Write a one-page essay describing a personal situation that would positively or negatively, impact long-term skilled trade employment.

2.5 Identify five skilled trades and/or industry occupations that are most likely to be transitory and describe specific aspects of each.

3.0 SELF-EMPLOYMENT

Instructional Goal

The goal is to develop an understanding of self-employment, independent contractor, and sub-contractor status in the skilled trades and industry.

Objectives

Given lecture, discussion, and small group exercises the student will be able to:

3.1 Write a one-page summary of the main points of Oregon State Law regarding contractor registration which includes the categories of registration, the conditions for qualifying in each category and the name of the agency that administers the law.

3.2 Write a simple business proposal which includes a summary of past work, market strategy, funding options, and scope of work.

3.3 Describe the function of the Contractor's licensing Board and include a description of how the technical assistance unit of the Board can be used to assist workers in the skilled trades and industry.

4.0 SELECTION METHODS

Instructional Goal

The goal is to develop an understanding of how to prepare for the competitive selection methods in the skilled trades and industry.

Given lecture, discussion, and small group exercises the student will be able to:

4.1 Describe four distinct procedures that are competitive means when entering or advancing in skilled trade/industrial occupations.

4.2 Describe at least two conditions of the skilled trade/industrial workplace that explain why a valid driver's license, good driving record and reliable transportation improve the chances to enter and advance in the skilled trades and industry.

4.3 Identify discriminatory language in questions from a list of hypothetical questions which might be asked by employers in skilled trades and industry.

4.4 Define the term "mechanical-spatial" and give three examples of mechanical-spatial skills.

4.5 Describe five ways in which mechanical-spatial tests assist employers in selecting applicants for apprenticeships and trade training programs.

4.6 Identify two standard tests used in the skilled trades and industry, identify the trades and write a descriptive summary of each test.

HEALTH AND FITNESS FOR INDUSTRY

HPE 296

2 Credit
1 Lecture
4 Lab
60 Clock

Course Content Guide

Prepared by
Michael Perrine

HEALTH AND FITNESS FOR INDUSTRY
HPE 296

I. INTRODUCTION

HPE 296 is specifically designed for students preparing to enter the physically demanding industrial occupations. The purpose is to increase awareness of health factors and directly increase physical performance required for entry and success within the trades. The following areas will be included: wellness, cardiovascular health, physical fitness, nutrition and stress management.

This course will be offered for two credits consisting of one hour of lecture and four hours of laboratory per week per term. Data strongly suggests that the additional hours of laboratory is essential for students to achieve minimal standards required to enter the trades.

II. COMMENTS ON COURSE ACTIVITIES AND DESIGN

Lecture, group discussions, demonstrations and audio-visual materials will aid the student in developing his/her knowledge. Health and fitness principles will be applied directly through participation in supervised laboratory activities.

III. PREREQUISITE KNOWLEDGE AND SKILLS

There are no prerequisites for this course. A physicians medical release is required on PCC form.

IV. EVALUATION

Evaluation will be based on:

a. Written exams

b. Lab performance

c. Course worksheets

d. Attendance

V. INSTRUCTIONAL GOALS AND OBJECTIVES

The instructor will be required to cover the goals and objectives listed in this Course Content Guide. The course content guides are developed by college-wide subject area faculty and approved by management.

1.0 WELLNESS

The goal is to develop an understanding of the holistic approach to health and the concept of wellness and to be able to evaluate one's own level of wellness.

Objectives:

1.1 Explain the philosophy of holistic health care.

1.2 Discuss the following as determiners of optimal well-being:

a. Self responsibility

b. Physical fitness

c. Stress management

d. Nutrition

e. Environmental sensitivity

1.3 Describe the Farquhar system of self-directed behavior changes.

1.4 Identify common health habits most conducive to improved health status and long life as given by the instructor.

1.5 Describe the three levels of health care: primary, secondary and tertiary prevention.

2.0 PHYSICAL FITNESS

Instructional Goal:

The goal is to be able to understand physiological and psychological changes that take place as a result of a physical conditioning program.

Objectives:

2.1 Define the following and explain how they relate to physical conditioning:

a. Overload principle

b. Aerobics/anaerobics

c. Use it or lose it principle

d. Specificity

e. Warm up; cool down

2.2 Explain the following basic components of fitness and give examples of activities that will influence each of them.

a. Muscular strength

b. Muscular endurance

c. Flexibility

d. Cardio-respiratory capacity

2.3 Describe the physiological changes which occur during exercise.

2.4 Identify the psychological changes that occur during exercise.

2.5 Discuss reasons for participating in physical activity.

3.0 CARDIOVASCULAR HEALTH

The goal is to develop an understanding of cardiovascular health disease mechanisms and prevention.

Objective:

3.1 Identify the structures and functions of the heart.

3.2 Explain the relationship of the following risk factors to atherosclerosis:

a. Overweight

b. Smoking

c. Diabetes

d. Heredity

e. Stress

f. Cholesterol - high density and low density

g. Lack of exercise

The following objectives will be met during the laboratory portion of the course.

1.0 PRE-ASSESSMENT OF PHYSICAL CONDITION AND BODY MEASUREMENTS

Instructional Goal:

The goal is to test and measure the students' physical condition.

Objectives:

Evaluate your physical condition and body measurement by means of one or more of the following:

1.1 Health related fitness test

1.2 Cooper 12 minute run/walk

1.3 Body measurement, weight, height recording and blood pressure

1.4 Strength test

2.0 COMPONENTS OF FITNESS

Instructional Goal:

The goal is to give the student a better understanding of fitness.

Objectives:

Discuss the following components of fitness:

2.1 Development overview (F.I.D.: "F"requency. "I"ntensity, "D"uration)

2.2 Safety in performance

2.3 Progression

3.0 AEROBIC CONDITIONING/CIRCUIT WEIGHT TRAINING

Instructional Goal:

The goal is to gain knowledge and skills in aerobic conditioning activities.

Objectives:

Practice the following activities for aerobic conditioning:

3.1 Circuit Weight Training

3.2 Walking/Jogging

3.3 Aerobic dance/exercise (routines)

3.4 Pickle ball

3.5 Basketball

4.0 STRENGTH CONDITIONING

Instructional Goal:

The goal is to gain strength through conditioning activities.

Objectives:

4.1 Define the physiology of strength development

a. Static, dynamic

b. Atrophy

c. Adaptation and overload

4.2 Discuss skills/methods (progression and safety will be taught with each of the following methods):

a. Posture evaluation and exercise prescription

b. Rhythmic exercise

c. Weight training

d. Weight lifting

e. Circuit training

f. Partner exercise

g. Individual strength home workout sheets

5.0 FLEXIBILITY CONDITIONING

Instructional Goal:

The goal is to develop flexibility through stretch conditioning.

Objectives:

5.1 Discuss stretch mechanics and approaches

a. Stress awareness as it relates to flexibility development

5.2 Practice skills/methods (progression and safety to be explored using the following methods):

6.0 POST-ASSESSMENT OF PHYSICAL CONDITION AND BODY MEASUREMENTS

Instructional Goal:

The goal is to test and measure the students' physical condition.

Objectives:

Evaluate your physical condition and body measurement by means of one or more of the following:

6.1 Health related fitness test

6.2 Cooper 12 minute run/walk

6.3 Body fat measurement, weight, height recording, blood pressure

6.4 Strength testing

INTRODUCTION TO APPLIED CONSTRUCTION II

BCT 3.210
5-Week Course

5 Credits
5 Lecture
15 Lab
100 Clock

BUILDING CONSTRUCTION
TECHNOLOGY

COURSE CONTENT GUIDE

Prepared by John Fulton

DEFINED OUTCOMES

This section is a statement of final learning outcomes and does not attempt to state how, or in what order, the defined outcomes will be presented.

The following factors will influence the student's ability to complete the defined outcomes: motivation and attendance, speed of mastering the subject matter, and availability of material and/or equipment.

I. PURPOSE

The purpose of this course is to develop an understanding of how residential construction practices relate to residential plans. The student will also be exposed to a variety of hands-on experience such as: foundations, framing, drywall, equipment operation.

II. INTRODUCTION

The student will study typical residential construction practices and residential plans.

III. The student's time is divided between lecture and hands-on. They will visit various areas of the "on campus" building construction program projects to observe in process/finished assemblies. The instructor will use several different sets of residential plans to acquaint the student with the different construction methods and materials. Emphasis will be on recognizing the standard material symbols, abbreviations, architectural lines language, specifications and terminology used on a set of residential plans.

IV. PREREQUISITE KNOWLEDGE AND SKILLS

None

V. EVALUATION

Evaluation procedures will be discussed during the first class meeting.

VI. COURSE OUTLINE

This is a topical outline and is not necessarily the sequence in which the material will be presented.

1.0 Working drawings and blueprints
2.0 Reading elevation drawings
3.0 Reading floor plans
4.0 Symbols and notations used on floor plans
5.0 Scaling and dimensioning practices
6.0 Reading blueprints for structural information
7.0 Reading detail drawings
8.0 The plot plan
9.0 Reading blueprints for trade information
10.0 Reading a set of blueprints
11.0 Building codes
12.0 Walls and foundations
13.0 Roof and ceiling framing
14.0 Site work
15.0 Miscellaneous

1.0 WORKING DRAWINGS AND BLUEPRINTS

The first chapter clears up some misinterpretations of the terms architect's plans, working drawings and blueprints. The relationships among the owner, the architect and the builder are covered. The contents of a set of working drawings are suggested. Various methods of making blueprints are briefly explained.

OBJECTIVES FOR THE STUDENT

1.1 To know the functions of working drawings and blueprints.
1.2 To understand the relationship between the owner and architect in developing working drawings.
1.3 To gain a general idea of the contents of a set of working drawings.
1.4 To know about different blueprint making processes.

2.0 READING ELEVATION DRAWINGS

Elevation drawings are presented first because they show the building as it might look in a picture. Before being asked to study a blueprint the students are given information about techniques used to conserve space on the drawing and to save drafting time. These include symbols for material, symbols for building parts such as windows and abbreviations.

Elevations drawings must be read in conjunction with plan views and one elevation must be compared with another. Dimensions for the location of a window may be shown on a plan view or an elevation view. Usually horizontal locating dimensions are shown on a plan view and vertical locating dimensions on an elevation view. Information on roofs usually is obtained by studying and relating all of the elevation views.

OBJECTIVES FOR THE STUDENT

2.1 To learn the symbols for materials.
2.2 To know how to interpret abbreviations (some should be memorized.)
2.3 To learn the symbols for building parts.
2.4 To learn about roof types.
2.5 To learn the alphabet of lines.
2.6 To know how to read elevation working drawings for materials, windows, roof shapes and dimensions.

3.0 READING FLOOR PLANS

This chapter provides a basis for reading the working drawing of floor plans in Chapters 5 and 6. Some students may have difficulty understanding floor plans, which portray horizontal slices through a building, with information on only one plane. Basic rules for reading floor plans are presented first. Then each type of floor plan is discussed in detail using several examples. The houses have one, two or one and one-half stories.

OBJECTIVES FOR THE STUDENT

3.1 To learn basic concepts in reading floor plans such as:
- A. Drawing to scale.
- B. Interrelation of floor plans to other drawings in a set of working drawings.
- C. The location of the cutting plan that produces the floor plan.

3.2 Studying a sketch plan for a one-story house to understand room layout.

4.0 SYMBOLS AND NOTATIONS USED IN FLOOR PLANS

This chapter covers architectural symbols and abbreviations used in working drawings. It also covers symbols for plumbing and electrical equipment and devices. The working drawings for a one-story residence are partially developed in three progressive steps. The complete working drawing for the first floor of a contemporary house is the subject of the Trade Competency Test for the chapter. The elevation views for this house were studied in Chapter 3 (figures 3-7 through 3-10).

OBJECTIVES FOR THE STUDENT

4.1 To learn the symbols for building materials on work drawing plan views.
4.2 To learn the symbols for windows and doors.
4.3 To learn some common electrical symbols.
4.4 To learn some common symbols for plumbing fixtures.
4.5 To become familiar with abbreviations used on working drawing plan views.
4.6 To read floor plan working drawings.

5.0 SCALING AND DIMENSIONAL PRACTICES

This chapter deals with measuring practices used in making working drawings, reading them and using the measurements on the job.

OBJECTIVES FOR THE STUDENT

5.1 To learn the importance of drawing to scale.
5.2 To understand how the architect's scale is used.
5.3 To learn how to use a pocket rule to take measurements from a blueprint.
5.4 To learn dimensioning standards for exterior walls, partitions and the location of windows and doors.

6.0 READING BLUEPRINTS FOR STRUCTURAL INFORMATION

Previous chapters teach how to read working drawings for information on layout, materials, and equipment. Chapter 7 shows how this knowledge is applied in using working drawings to erect a building. Sectional views are used to give most of the information about construction. The builders fall back on their trade background to fill in the details. The chapter covers basic types of work frame construction including platform, balloon and plank and beam. Basic brick veneer and masonry construction are discussed. The process of prefabrication using building components and panels is outlined. The chapter concludes with an intensive study of vertical sectional views taken from the two-story building examined in previous chapters.

OBJECTIVES FOR THE STUDENT

6.1 To understand some of the problems involved in using working drawings to build a house.
6.2 To learn the basic features and advantages of platform framing (western framing is an alternative term).
6.3 To learn the basic features and advantages of balloon framing.
6.4 To learn the basic features and advantages of plank and beam framing.
6.5 To learn how wood framing and masonry construction are combined using brick veneer or solid masonry exterior walls.
6.6 To understand the process of building with components and modules.
6.7 To make an exhaustive study of several sectional views.

7.0 READING DETAIL DRAWINGS

For most buildings the working drawings consisting of floor plans and exterior elevation views must be supplemented with the additional information contained in detail views. Detail views are usually drawn at a larger scale and are included in the set of working drawings.

Drawings of elevations of walls inside the building are considered to be details. They show such things as the fireplace, special wall treatment with paneling, kitchen and bathroom cabinets, equipment and fixtures.

Other details of construction involve the foundation, the manner of framing wood members, and the laying of brick in some decorative way. Most windows and doors are delivered complete with frames ready for insertion in the walls. Detail drawings are often included among the working drawings to show how the wall should be prepared to receive the windows and doors and how the trim is to be applied. Detail drawings are also provided for all the architectural woodwork in the house. This would include fireplace mantels and built-in millwork such as bookcases, chests of drawers, kitchen cabinets, vanities and moldings. Exterior details would include cornices, moldings, front entrance doorways and decorative window trim.

OBJECTIVES FOR THE STUDENT

7.1 To understand the need for detail drawings and why they are often drawn at large scale.
7.2 To review information on the use of section lines and to understand how plan and elevation drawings are keyed to detail views.
7.3 To discuss the use of detail views to clarify features that are unusual in the construction of the building.
7.4 To discuss the use of detail views to clarify features that are unusual in the construction of the building.
7.5 To learn how to read detail drawings of windows and doors.
7.6 To discuss the use of detail drawings to show architectural woodwork.

8.0 PLOT PLAN

A plot plan is required for every set of working drawings whenever the building is to be erected where building and zoning codes are in effect. A licensed surveyor prepares a survey plot of the property. This becomes a legal document required by the building authority and loaning institutions. The architect draws the plot plan to show the location of the house on the lot, walks and drives, elevations of the floors, location of utilities and sewers and other similar information helpful to builders.

OBJECTIVES FOR THE STUDENT

8.1 To understand the role of the surveyor and the need for the surveyor's plot.
8.2 To know something about building ordinances.
8.3 To understand the features of a plot plan including:
- A. The point of beginning;
- B. The location of the house in relationship to the point of beginning and lot lines;
- C. Elevations of the footing, basement, and first floors;
- D. Location of walks and drives;
- E. Location of utilities and sewers;
- F. Trees and landscaping to be removed or preserved.

8.4 How contour lines are drawn to indicate the natural and finish grades.
8.5 How to adjust elevation dimensions to produce a 100'-0" base.
8.6 Student will draw plot plan

9.0 READING BLUEPRINTS FOR TRADE INFORMATION

A high degree of skill is essential for each type of building mechanic. A clear-cut division of labor as well as coordination of work between the trades is required for the smooth operation of a construction job. This chapter discusses the way people in different key trades interpret the parts of the blueprints that bear on their particular work. (The work of carpenters has been considered in several previous chapters because they are responsible for the basic structure.)

Except for the location of outlets and switches shown on the floor plans of the working drawings, the work to be done by electricians is not shown. For residential buildings the electricians must design an electrical plan showing the division of the circuits leading to the outlets. They also must check local and national electrical codes for wiring the house.

Information for plumbers is likewise missing from the working drawings except for the location of fixtures on the floor plans. No indication is made as to how water supply lines and the sewage and drainage systems are to be installed. Plumbers and carpenters must cooperate to provide spaces in walls for piping and floor support for heavy fixtures.

Sheet metal workers are involved in several areas of house building. They provide the gutters and downspouts used to carry rainwater away. They make waterproofing shields, called flashing, at chimneys and over windows and doors. Perhaps their most important function is to install warm air heating and air cooling equipment. Duct work must be planned before framing the house if ducts are to be placed conveniently.

Other mechanics discussed in this chapter are cement masons (who work with placing concrete), bricklayers and masons.

Welding is a skill used by several trades. Some weld pipe, others weld structural shapes and still others weld sheet metal. Blueprints that show welding symbols are generally shop drawings.

OBJECTIVES FOR THE STUDENT

9.1 To understand the division of labor among trade groups and the function of each in the building of a house.
9.2 To understand what kinds of information the mechanics need to execute their particular work.
9.3 To understand some basic concepts about prefabrication using building components and modular sections of houses.
9.4 To understand what is involved in modular dimensioning and planning.
9.5 To understand the job of the plumber in running supply and waste lines and installing fixtures.
9.6 To understand the job of the sheet metal worker in exterior work such as creating gutters, downspouts, flashing and decks and in interior work such as installing heating and air conditioning systems.
9.7 To understand how the several types of heating plants operate.
9.8 To understand the work of carpenters and cement finishers in erecting form work and placing concrete.
9.9 To understand some of the work of bricklayers and masons.
9.10 To understand how several trades use welding, what processes are and to know the symbols used.

10.0 READING A SET OF BLUEPRINTS

This chapter summarizes the blueprint reading techniques taught throughout the book. It begins with a study of the room layout to orient the students. See the sketch plans in figures 11-1 and 11-2. Elevation views from the working drawings are discussed to give the students a complete picture of the exterior. The floor plans are then studied in detail. Each sheet is described in the text to point out important features. After carefully reading the chapter and studying the blueprints, the students should be prepared for a final examination.

OBJECTIVES FOR THE STUDENT

10.1 To develop a systematic approach to reading a set of working drawings as follows:

- A. Observing the general floor plan layout.
- B. Observing the elevation views.
- C. Studying the floor plans thoroughly.
- d. Coordinating the sectional view and elevation views with the plan views.

11.0 BUILDING CODES

The student will study the uniform building code for the necessary information relating to the permit process and plot plans.

12.0 FOUNDATIONS

12.1 Concrete

- A. Aggregate
- B. Premix
- C. Strength (PSI)

12.2 Footings

- A. Continuous
- B. Stepped
- C. Reinforcing
- D. Key ways

12.3 Walls (foundations)
- A. Concrete
  - 1. Forming
  - 2. Reinforcing
  - 3. Pouring concrete
    - a. Direct
    - b. Moving with wheelbarrow
    - c. Pneumatic pumping
- B. Monolithic
  - 1. Concrete blocks
  - 2. Flatwork

12.4 Daylight Basement
- A. Combination concrete & wood walls

12.5 Crawl Space
- A. Post and beam
- B. Beam pockets

12.6 Miscellaneous
- A. Vapor barriers
- B. Anchor bolts
- C. Drain tile
- D. Rebar
- E. Water proofing
- F. Piling (when needed)
- G. Soil bearing capacity
- H. Site plan/location/layout
- I. Building codes

13.0 ROOF AND CEILING FRAMING

13.1 Types of Roof Framing
- A. Gable
- B. Hip
- C. Dutch hip
- D. Shed
- E. Flat
- F. Gambrel
- G. Mansard
- H. Butterfly

13.2 Ceiling Joists

13.3 Rafters
- A. Common
- B. Hip
- C. Valley
- D. Valley
- E. Hip jack rafter

13.4 Collar Beams

13.5 Ridge Board

13.6 Cornices
- A. Fascia
- B. Soffit (plancier)
- C. Look out
- D. Ledger
- E. Screened vents
- F. Bird blocking

13.7 Roof Trusses

13.8 Sheathing

13.9 Codes

14.0 SITEWORK

14.1 Elevations
14.2 Contour lines
14.3 Plot plan
14.4 Locate house corners on lot
14.5 Batter boards

5.0 MISCELLANEOUS

15.1 Stairs

15.2 Codes

15.3 Drywall

15.4 Equipment Operation

- A. Fork lift
- B. Backhoe or Crawler

PROJECTS

1. Build a section of concrete footing/wall forms.

2. Frame a roof system from blueprints.

3. Apply and finish drywall

4. Construct set of stairs

5. Operate forklift

6. Operate heavy equipment

INTRODUCTION TO ELECTRICAL/MECHANICAL TRADES: PART II

BCT 3.211
5-Week Course

5 Credits/week
5 Lecture/week
15 Lab/week
100 Clock

BUILDING CONTRUCTION
TECHNOLOGY

COURSE CONTENT GUIDE

Prepared by Ray Sytsma

INSTRUCTIONAL UNIT

BASIC A.C. THEORY

Objective: Give the student as much first time exposure to A.C. theory as possible.

Method: Lecture and demonstrations. Brief general coverage of principles.

1.0 Review Ohms Law.

1.1 Solve for ohms, volts and amperes, using ohms law triangle.

2.0 Alternating current, A.C.

2.1 Definition (use of oscilloscope, films and other visual aids.

2.2 Advantages of using A.C.

3.0 Frequency

3.1 Hertz. Unit of frequency. 1 cycle per second.

3.2 Commercial frequency in use is 60 hertz.

4.0 Voltage

4.1 Average

4.2 Effective equal to work done by equal D.C. voltage.

4.3 Peak

5.0 Impedance

5.1 Similar to D.C. resistance

5.2 Measured in ohms, also.

5.3 Must include new terms and values of capacitance and inductance.

INSTRUCTIONAL UNIT

ELECTRONICS: (GASEOUS AND SOLID STATE ELECTRICAL)

Objective: To illustrate to the student the part electronics plays in the electrical fields.

Method: Lecture and demonstration of electronic units for measurement and control. *

1.0 Oscilloscope

- 1.1 Waveform
- 1.2 Measuring

2.0 Solid state test device

- 2.1 Voltmeters
- 2.2 Ammeters
- 2.3 Frequency instruments

3.0 Controls

- 3.1 Programmable controller

*Note: Demonstration and lecture not to understand or "learn" the devices, but to illustrate and demonstrate that electronics can and does play an important part of the electrical trades.

INSTRUCTIONAL UNIT

HAZARDOUS AREAS AND ELECTRICAL EQUIPMENT

Objective: To become familiar with the classes and divisions of hazardous areas that require special consideration as regards electrical installations, as required by National Electric Code.

Method: Lecture, examples of explosion-proof equipment and work sheets.

1.0 Definition of class I locations.

1.1 Class I, Div. I

1.2 Class I, Div. 2

1.3 Work sheets

2.0 Definition of Class II Locations

2.1 Class II, Div. 1

2.2 Class II, Div. 2

2.3 Work sheets

3.0 Definition Class III Locations

3.1 Class III, Div. 1

3.2 Class III, Div. 2

3.3 Work sheets

WORK SHEET QUESTIONS

HAZARDOUS AREAS

1. What is a Class I, Div. I hazardous area?

2. How would you describe an "intrinsically safe" system?

3. An environment heavy with _____ would be a class II area.

4. What is the definition of "explosion proof"?

5. Why are the electrical trades so concerned with hazardous areas?

WORK SHEET QUESTIONS

6. What purpose do "seals" serve?

7. What class hazardous area would be around gasoline pumps?

8. The area around a farmer's seed cleaning plant might be a Class _____ hazardous area.

9. Are the hazardous areas limited to certain wiring methods?

10. Can M.I. (Mineral Insulated Cable) be used in all hazardous areas?

INSTRUCTIONAL UNIT

BASIC MOTOR TYPES AND USES

Objective:For the student to understand the wide range of motor types and uses.

Method: Lecture, demonstration and hands on.

1.0 Appliance, small motors, single phase

1.1 Dishwashers, garbage disposals, etc.

1.2 Single phase capacitor and split phase.

1.3 Basic difference in characteristics.

1.4 Size range.

2.0 Universal motors

2.1 Vacuum cleaners (portable), mixers, drills and handtools.

2.2 Type description

2.3 Limitations

2.4 Size range

3.0 Three phase motors

3.1 Typical uses in industry.

3.2 Advantages

3.3 Size ranges

4.0 Disassemble and assembly of split phase motor or capacitor motor.

4.1 Make witness marks (center punch) to aid in reassembly.

4.2 Take motor apart. Identify major components: End bells stator, rotor, bearings and centrifugal mechanism.

4.3 Identify starting winding and running winding.

5.0 Three phase motor disassembly and reassemble 2-5 H.P. motor.

5.1 Witness marks to aid in reassembly.

5.2 Take motor apart and identify major components: Stator, rotor, bearings, end bell and housing.

6.0 Dual voltage motor

6.1 Student to follow nameplate or connection data and connect for each voltage and run under supervision of instructor.

WORK SHEET

SINGLE PHASE MOTORS; SPLIT PHASE

Objective: Familiarization with single, split phase motors.

Method: Demonstration of type and use by instructor. Hands on assembly and disassembly by student.

1.0 Disassembly

1.1 Use of witness marks to aid reassembly.

1.2 Identification of rotor, stator, running winding, starting winding and centrifugal switch.

2.0 Reassemble and test run

2.1 Connect for both CW and CCW rotation.

2.2 Dual voltage.

a. Connect and test run for lower voltage.

b. Connect and test run for higher voltage.

(Portland, Community College, Cascade Campus, has control and motor lab).

WORK SHEET QUESTIONS

MOTORS, SINGLE PHASE

CAPACITOR

1. List the advantages that a capacitor motor has over a split phase motor.

2. Are capacitor motors available in 1 to 3 H.P.?

3. List three typical applications for capacitor motors.

4. What is the purpose of the centrifugal switch?

5. Can the direction of rotation be changed?

WORK SHEET QUESTIONS

MOTORS, SINGLE PHASE

SPLIT PHASE

1. What are typical uses for this type motor?

2. What are the limitations of this kind of motor?

3. How can this motor be reversed?

4. Is this type motor available in 2 or 3 H.P.?

5. What is the purpose of the centrifugal switch?

INSTRUCTIONAL UNIT 3

JOB SITE VISITATIONS

Objective: Student may observe materials and tools studied in Unit 1 and Unit 2, and how they are used.

1.0 Residential Wiring Installations in progress.

2.0 Commercial wiring installations in progress.

After job site visitations, a critique should be held and student questions and discussion encouraged.

WORK SHEET QUESTIONS

RESIDENTIAL WIRING JOB SITE

1. How many receptacle outlets does the house have?

2. How many switches?

3. How many lighting outlets?

4. The front edge of outlet boxes is not even with the stud. Why?

5. Soldering is an excellent method of splicing conductors. Why isn't it used more?

WORK SHEET QUESTIONS

6. How was cable fastened in place? What is the maximum allowable distance between supports, as stated in the N.E.C.?

7. The kitchen receptacle outlets are on the so-called appliance circuits. What is the minimum ampere ratings of these circuits?

8. What was the height to center of the meter base (above grade)? Who sets the minimum and maximum height limits?

9. Why aren't houses and apartments wired, using conduit?

10 Residential wiring is highly competitive. What are your thoughts on workers' speed and efficiency?

WORK SHEET QUESTIONS

RESIDENTIAL (JOB SITE)

1. How large is the service? (Amperage rating)

2. What type of heat did the home have?

3. In your opinion, was this wiring done in a neat and workman-like manner? List your reasons.

4. Does the home have an electric water heater?

5. Does the home have a dryer?

WORK SHEET QUESTIONS

6. Is the home using a built in oven and cook top or wired for older type conventional range?

7. How would you improve the electrical system?

8. If there is an underfloor "crawl" space, why wasn't more wiring run in that space, instead of overhead?

9. Is the home wired for a door bell or chime?

10. Is the home wired for an outdoor receptacle? List the Article and SEction number of this N.E.C. requirement.

WORK SHEET QUESTIONS

COMMERCIAL JOB SITE

1. What type occupancy is the building intended for?

2. What wiring method is being used?

3. What type lighting fixtures are being used?

4. Compose a list of tools and machines necessary to make this installation, as compared to a residential wiring installation.

5. Would you say this type of installation would require more or less physical strength and stamina than residential wiring?

WORK SHEET QUESTIONS

6. List and name as may kinds of wiring materials as possible that you observed on the job.

7. How many electricians?

8. Was there an electrician foreman?

9. What importance do blueprints have here?

10. Is there any <u>good</u> reason why some one cannot do this work?

WORK SHEET QUESTIONS

COMMERCIAL JOB SITE

1. What are the work hours for the electrical crew?

2. Are ladders and scaffolds a part of the equipment needed?

3. Are power tools being used?

4. Are work places relatively clean and free of debris?

5. Do the electricians in general work in teams or in close cooperation, or singly and alone?

WORK SHEET QUESTIONS

6. Approximately, what is the wage scale?

7. In your opinion, are the electricians enjoying their work? Do they appear confident and efficient? List your reasoning.

8. Do you see where there would be any satisfaction in making an electrical installation and then having it work flawlessly? List your reasons.

9. Can you see where there is room for innovation and initiative in the electrician's job? List your reasons.

10. Competent electricians are a marvelous combination of mechanical genius, engineering ability and an efficient workman. Why is this true or not true? List your reasons.

WORK SHEET QUESTIONS

INDUSTRIAL PLANT JOB SITE

1. When electricians perform maintenance for industrial plants, is a high degree of skill necessary? Why?

2. Compare the maintenance electrician's job with the construction electrician's job.

3. What is the approximate wage scale?

4. What kind of hours would the maintenance electrician expect?

5. Would knowledge of many different types of production machinery be more important to the maintenance electrician or construction electrician? Explain.

WORK SHEET QUESTIONS

6. How many different types of lighting fixtures were there in this plant?

7. List the different wiring methods used in the plant.

8. Is the use of electrical instruments (meters) an essential part of the job? How many kinds did you see?

9. Would a thorough understanding of motors be a requirement? What was the smallest and largest motor you saw (approximate H.P.)? Ask instructor or plant personnel.

10. Industrial plants utilize intricate and complex electrical control systems. Would you derive satisfaction and enjoyment from being proficient in finding troubles and fixing them fast? Explain.

CONTEMPORARY WORKSITE ISSUES IN SKILLED TRADES AND INDUSTRY

BCT 3.222

3 Credit
3 Lecture
30 Clock Hours

Building Construction Technology

Course Content Guide
Prepared by Christine E. Jones

DEFINED OUTCOMES

This section is a statement of final learning outcomes and does not attempt to show how, or in what order, the defined outcomes will be presented.

The following factors will influence the students ability to complete the defined outcomes:

Motivation and attendance, speed of mastering the subject matter, and availability of material and/or equipment.

I. PURPOSE

The purpose of this course is to develop an understanding of how the issues of safety, productive work habits, effective communication, bid processing and selection, and continued skills upgrading shape the work environment in the skilled trades and industry.

II. INTRODUCTION

The student will study the elements of the work environment that significantly impact successful transition into trade work.

This is a three (3) credit course that meets three hours per week for ten weeks.

Transferability of credit depends entirely upon the institution to which the student wishes to transfer.

The student should contact the Building Construction Department with respect to the cost of materials for this course.

III. COMMENTS ON COURSE ACTIVITY AND DESIGN

The students time is divided between lecture, discussion, and small group work. The student will be given a series of class projects to demonstrate her/his understanding of the particular aspects of the skilled trade work environment that make it distinct as a career choice.

IV. PREREQUISITE KNOWLEDGE AND SKILLS

None

V. EVALUATION

Evaluation procedures will be discussed during the first class session.

VI. INSTRUCTIONAL GOALS AND OBJECTIVES

This is a topical outline and not necessarily the sequence in which the material will be presented. For this outline the term "vocational education" specifically means vocational training for skilled trades and industry.

1.0 JOB SAFETY

Instructional Goal

The goal is to develop an awareness of the current issues regarding safety in the skilled trades and industry and the ways in which safety standards effect personal work habits.

Objectives

Given lecture, discussion and small group exercises the student will be able to:

1.1 Describe the function of safety regulatory agencies in Oregon including naming the organizations that directly influence worksites in the skilled trades and industry.

1.2 Formulate three hypothetical questions to ask when comparing the safety standards of industry employers.

1.3 Describe a hypothetical situation that might occur in industry when a safety decision is required and discuss a solution.

1.4 Identify the five leading causes of loss-time injuries among skilled trade workers in Oregon.

1.5 Describe six safety standards that apply to worksites in the skilled trades and industry and can be implemented by employees in daily work.

2.0 EFFECTIVE COMMUNICATION STYLES

Instructional Goal

The goal is to develop pan understanding of how the work environment effects communication between project owners, contractors, trades workers, and subcontractors.

Objectives

Given lecture, discussion, and small group exercises the student will be able to:

2.1 Define the terms: General Contractor, Prime Contractor, Owner, Subcontractor, Design Professional, Supplier, Inspector, Superintendent, Foreman, Engineer.

2.2 Chart the relationship between the Owner, General Contractor, Subcontractor, Superintendent, Foreman, and Skilled Trade Worker.

2.3 Analyze potential communications problems that might occur and by working in small groups, propose a workable solution.

2.4 Differentiate between effective and non-effective problem solving language in a hypothetical situation on a worksite in skilled trades or industry.

2.5 Describe what the phrase "ability to fit in" means in the context of the skilled trade environment.

2.6 Write a description of how a construction job progresses on a continuum from bid to final acceptance including the general sequence of craft tasks.

3.0 BIDDING PROCESS

Instructional Goal

The goal is to develop a general understanding of the bidding process in public works contracting and how the process shapes the work environment.

Objectives

Given lecture, discussion, and small group exercises, the student will be able to:

3.1 Define the terms: public works, Davis-Bacon, prevailing wage, EEO requirements, bid, performance bond, privatization, joint venture, pay estimates, change orders, plans and specs, and bid estimate.

3.2 Describe the major categories that comprise the bid proposal and name the one category that would include wages paid to skilled trades workers.

3.3 Describe how poor attendance habits from one skilled trade worker could influence an entire construction job.

3.4 Discuss possible solutions to a specific hypothetical worksite problem within an assigned small group and decide on one solution that contributes to a productive work environment.

4.0 SKILLS UPGRADING

Instructional Goal

The goal is to develop a plan for continued skills upgrading beyond journey level competency in skilled trade and industry employment.

Objectives

Given lecture, discussion, and small group exercises, the student will be able to:

4.1 Conduct an informational interview with a journey level skilled trades worker to determine the work of the trade over time including: promotion to supervisory, transfer of skills to four year degrees, estimating, business partnerships, and subcontracting.

4.2 Research the role of the community colleges and trade associations in skills upgrading opportunities to trades workers.

Instructional Goal

HEALTH AND FITNESS FOR INDUSTRY

HPE 297

2 Credit
1 Lecture
3 Lab
48 Clock

Course Content Guide

Prepared by
Michael Perrine

HEALTH AND FITNESS FOR INDUSTRY
HPE 297

I. INTRODUCTION

HPE 297 is designed as the second part of a two-term course. It is specifically designed for students preparing to enter the physically demanding industrial occupations. The purpose is to increase awareness of health factors and directly increase physical performance required for entry and success within the trades. The following areas will be included: wellness, cardiovascular health, physical fitness, nutrition and stress management.

This course will be offered for two credits consisting of one hour of lecture and four hours of laboratory per week per term. Data strongly suggests that the additional hours of laboratory is essential for students to achieve minimal standards required to enter the trades.

II. COMMENTS ON COURSE ACTIVITIES AND DESIGN

Lecture, group discussions, demonstrations and audio-visual materials will aid the student in developing his/her knowledge of health and fitness principles. Principles will be applied directly through participation in supervised laboratory activities.

III. PREREQUISITE KNOWLEDGE AND SKILLS

HPE 296--A physicians medical release is required on PCC form.

IV. EVALUATION

Evaluation will be based on:

a. Written exams

b. Lab performance

c. Course worksheets

d. Attendance

V. INSTRUCTIONAL GOALS AND OBJECTIVES

The instructor will be required to cover the goals and objectives listed in this course content guide. The course content guides are developed by college-wide subject area faculty and approved by management.

The following objectives will be met in the lecture portion of the course.

1.0 CARDIOVASCULAR HEALTH

1.1 Identify atherosclerosis as a cardiovascular disease and explain the three stages of the disease.

1.2 Explain briefly the treatments given for cardiovascular diseases.

1.3 Preventive measures that may be taken against cardiovascular disease.

2.0 NUTRITION

Instructional Goal:

The goal is to gain an understanding of the principles of good nutrition and be able to evaluate one's own diet with respect to nutritional needs and the control of body weight and composition.

Objectives:

2.1 List and briefly describe the following basic food components needed by the body.

a. Carbohydrates

b. Fats

c. Proteins

d. Minerals

e. Vitamins

f. Water

2.2 Explain "Basal Metabolic Rate (BMR)" and influences upon the basal metabolism and upon the energy needs of the individual.

2.3 Identify and explain the issues regarding the following nutritional controversies:

a. Cholesterol and Triglycerides

b. Need for fiber

c. Food additives

d. Junk food/Fast food

e. Organic food

2.4 Identify the various forms of vegetarian diets and discuss their advantages and disadvantages.

2.5 List the general functions of selected nutrients, their dietary sources, the results of dietary deficiencies or excesses.

2.6 Distinguish between overweight and overfat.

2.7 Relate caloric balance to changes in body weight.

2.8 Discuss guidelines for weight loss/weight gain and relate them to the fatness/lean body mass ratio.

2.9 Discuss the nutritional aspects of cancer.

3.0 STRESS AND STRESS MANAGEMENT

3.1 Define stress.

3.2 Identify physiological responses of the body to stress--short term and long term.

3.3 Describe the three stages of Selye's General Adaptation Syndrome (G.A.S.)

3.4 Identify psychological responses to stress--short and long term.

3.5 Compare eustress and distress.

3.6 Briefly describe the constructive and destructive use of defense mechanisms.

3.7 Distinguish between Type A and Type B behavior patterns.

3.8 Explain the implications of using maladaptive responses (e.g drugs/alcohol) to cope with stress.

3.9 Describe constructive methods of releasing stress such as:

a. Relaxation techniques

b. Meditation

c. Awareness exercises

d. Biofeedback

e. Exercise

3.10 Discuss the concept of stressors.

3.11 Identify and analyze personal stressors.

The following objectives will be met in the laboratory portion of the course.

1.0 AEROBIC CONDITIONING

Instructional Goal:

The goal is to gain knowledge and skills in aerobic conditioning activities.

Objectives:

Practice the following activities for aerobic conditioning:

1.1 Walking/Jogging

1.2 Basketball

1.3 Pickleball

1.4 Volleyball

2.0 STRENGTH CONDITIONING

Instructional Goal:

The goal is to gain strength through conditioning activities.

Objectives:

2.1 Discuss skills/methods (progression and safety will be taught with each of the following methods):

a. Posture evaluation and exercise prescription

b. Weight training

c. Weight lifting

d. Individual strength programs

3.0 POST-ASSESSMENT OF PHYSICAL CONDITION AND BODY MEASUREMENTS

Instructional Goal:

The goal is to test and measure the students' physical condition.

Objectives:

Evaluate your physical conditions and body measurement by means of one or more of the following:

3.1 Health related fitness test

3.2 12 minute run/walk

3.3 Body measurements, weight, height recording, blood pressure

3.4 Muscular strength testing

3.5 Flexibility test

INTRODUCTION TO MICROCOMPUTERS: B-FIT
BT 2.170

1 Credit
0 Lecture
5 Lab
20 Clock

COURSE CONTENT GUIDE

Prepared by J. Smith

Existing course

I. INTRODUCTION

This course provides an overview of microcomputer technology as related to practical business and office administration applications. Students will become aware of what can be done with a personal computer; apply the basic concepts and terminology of computers; and acquire hands-on skills of operating computer.

Course credit: 1 credit hour for 8 lecture and 4 lecture/lab hours.

Certificate and Degree requirements are met as determined by the Business Subject Area Curriculum Committee.

II. COMMENTS ON COURSE ACTIVITIES AND DESIGN

This course has the flexibility to be taught either in a lecture format or in a self paced "hands on" format. The student will have course materials and will use the computer to complete various exercises.

III. PREREQUISITE KNOWLEDGE AND SKILLS

To successfully complete this self-paced introductory course, students need the language skills and reading ability necessary for reading, understanding, and following written and oral communication.

IV. EVALUATION

This class is Pass/No Pass. In order to pass, the student must attend class, complete an objective test with a minimum of 75 percent accuracy, and demonstrate proficiency with the basic operational functions of the microcomputer.

V. INSTRUCTIONAL GOALS AND OBJECTIVES

The instructor will be required to cover the goals and objectives listed in this Course Content Guide. The Course Content Guides are developed by college-wide subject area faculty and approved by Management.

1.0 ORIENTATION TO THE MICROCOMPUTER

Instructional Goal:

The goal is to present the basic architecture of any computer and then explain how the microcomputer fits that structure.

INTRODUCTION TO THE MICROCOMPUTERS-BASICS

Objectives:

1.1 Define the basic architecture of any computer.

a. Compare microcomputer components with other computers
b. Describe the unit features of the microcomputer

2.0 VOCABULARY OF BASIC COMPUTER TERMS

Instructional Goal:

The goal is to develop a working knowledge of basic computer terms as applied to microcomputers.

Objectives:

2.1 Define various computer terms

3.0 MICROCOMPUTER OPERATIONS

Instructional Goal:

The goal is to develop a working knowledge of microcomputer operations.

Objectives:

3.1 Describe the operating system
3.2 Start the system
3.3 Perform basic operations

a. File directory
b. Formatting a blank disk
c. Copy
d. Erase
e. Command
f. Checking the Disk

3.4 Access and Save Programs
3.5 Describe, use, and maintain data disk filing systems.

4.0 EVALUATION

Instructional Goal:

The goal is to demonstrate a working knowledge of basic system operations.

Objectives:

4.1 Demonstrate the basic system operating functions of starting the computer, formatting a disk, checking a disk, making a back-up copy, inputting and running a simple program, and loading and running an applications program.

4.2 Pass with at least 75 percent accuracy, a comprehensive objective test.

WELDING PRACTICE
WLD 9.050AC
1-Week Course

1 Credit
20 Lab

COURSE CONTENT GUIDE

WELDING PRACTICE
WLD 9.050AC

This course provides training in S.M.A.W. (shielded metal arc welding), G.M.A.W. (gas metal arc welding), F.C.A.W. (flux-cored arc welding), O.A.W. (oxy-acetylene welding), O.A.C. (oxy-acetylene cutting), and basic fabrication. Course covers uses, safety, nomenclature, equipment operation, and set-up, shutdown procedures and basic fabrication.

WORK EXPERIENCE
BUILDING CONSTRUCTION
BCT 3.280AA

1-12 Credits
1 Credit = 50 Clock Hours

COURSE CONTENT GUIDE

Prepared By W. Nilsen

Existing course

I. INTRODUCTION

Building Construction Work Experience is designed to help the student develop career objectives by linking their portland Community College course work with off-campus learning experiences in the construction industry. Participation in the course can be beneficial for students who are making career transitions, determining educational goals related to their present occupation, or wanting on-the job experiences which are related to their career goal. Work experience is also used to measure a student's progress and skill level.

This course will focus on demonstrating knowledge of construction techniques, materials and equipment, and on gaining a general understanding of a construction company's work procedures. This is a 16-credit-hour course, requiring 40 hours per week on the job site for 12 weeks.

II. COMMENTS ON COURSE ACTIVITIES AND DESIGN

This "hands-on" work experience course will give students the opportunity to test the knowledge and skills gained in the classroom and lab. The availability of suitable job training sites and the students' individual skill levels help determine where they are placed. Students are encouraged to develop their own job sites. Students will maintain contact with the college while on work experience, through their instructor. Job sites will be carefully monitored, and students will be evaluated buy their instructor and the job site supervisor. Alternative "work experience" projects will be available in the school shop.

III. PREREQUISITE KNOWLEDGE AND SKILLS

This course is offered to students whose class standing and/or skill levels have been approved by their instructor.

IV. EVALUATION

Students will be evaluated on their ability to function on the job site, on their maintaining contact with their instructor, and on written evaluations from their job site supervisors.

V. INSTRUCTIONAL GOALS AND OBJECTIVES

Upon successful completion of this course, the student will have satisfactorily accomplished the goals and objectives listed in this Course Content Guide. The Course Content Guides are developed by college-wide subject area faculty and approved by management.

1.0 WORK EXPERIENCE

INSTRUCTIONAL GOAL:

The goal is to develope skills and knowledge of work procedures by training on an approved job site.

OBJECTIVES

1.1 Demonstrate a positive attitude and the ability to work well with others on the construction site.

1.2 Demonstrate knowledge of equipment and tools used in construction.

1.3 Interpret various types of specifications and blueprints used in construction.

1.4 Estimate the amount, cost, and labor cost of materials required in various types of construction.

1.5 Demonstrate use of various construction materials.

1.6 Demonstrate proper safety procedures in all phases on construction.

1.7 Fulfill the number of clock hours required to earn the work experience credits for the term.

1.8 Understand the use and interpretation of contracts used in construction.

2.0 COMMUNICATION WITH COLLEGE

INSTRUCTIONAL GOAL:

The goal is to maintain on-going communication with your instructor during the work experience phase of your program.

OBJECTIVES:

2.1 Establish communication with your instructor at the beginning of the term to complete written forms and receive assignments.

2.2 Set up meeting times or seminar schedule with your instructor to discuss job site progress during the term.

2.3 Be available to discuss job site and employer evaluations with your instructor.

Sample Class Schedule Term #1, B-FIT Program

B-FIT Class Schedule
Week of March 25-29

Time	3/25/91 Monday	3/26/91 Tuesday	3/27/91 Wednesday	3/28/91 Thursday	3/29/91 Friday
7:00-8:00	GYM Early PE	GYM Early PE	GYM Early PE	GYM Early PE	
8:00-9:00	GYM Late PE	GYM Late PE	GYM Late PE	GYM Late PE	
9:00-10:00	Career Development Orientation Group I & II 3/124	Trades Math Group I 3/124	9:00-11:00 Career Development Group I & II 3/124	Trades Math Group I 3/124	9:00-11:00 Job Club Group I & II 3/124
10:00-11:00	General Orientation Group I & II 3/124	Trades Math Group II 3/124		Trades Math Group II 3/124	
11:00-12:00	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
12:00-4:00	Orientation Construction Group I 2/204 Orientation Elec/Mech Group II 3/124	Construction Group I 2/204 Elec/Mech Group II 3/124	Construction Group I 2/204 Elec/Mech Group II 3/124	Construction Group I 2/204 Elec/Mech Group II 3/124	Construction Group I 2/204 Elec/Mech Group II 3/124

B-FIT

Building Futures in Industry and Trades

Student Orientation/Application Packet

Portland Community College

B-FIT (Building Futures in Industry & Trades)
PROGRAM APPLICATION

DATE OF APPLICATION _____ SOCIAL SECURITY #_____

_____
LAST NAME FIRST NAME M.I. DATE OF BIRTH

_____
STREET CITY COUNTY STATE ZIP

PHONE: (_____)_____

HOW HEARD OF PROGRAM:_____

CURRENT FORM OF TRANSPORTATION: (List make and year of car if applicable)

DRIVERS LICENSE #_____ I do not have a drivers license_____

_____
CURRENT MARITAL STATUS:

_____ Single (never married)
_____ Married
_____ Divorced
_____ Separated
_____ Widowed

How long have you been separated, divorced, or widowed:

not applicable less than one year 1-5 years

_____more than 5 years.

Are you the primary source of support for your household? Yes No

Number of children at home? _____
Under the age of 18 _____
Under the age of 3 _____

CURRENT CHILDCARE ARRANGEMENTS:

_____

How will your children be cared for while you are attending class or working?

_____

CURRENT HOUSING:

____Rent ____Own ____Other (Ex. living with parents)
____Apartment ____House ____Other (please specify) _____
____Number of people currently living in your household

B-FIT

Estimated Budget for 5 Month Training Program

Instructions: Estimate expenses for yourself and anyone dependent on you for one month during the training program:

Fixed Expenses	Monthly
Food	$_____
Housing (rent/mort)	_____
Utilities:	
heat	_____
electricity	_____
phone	_____
other utilities	_____
Child care	_____
Transportation:	
car: gas & maint.	_____
public transit	_____
Medical	_____
Dental	_____
Debts (min.mon.paymts.)	_____
Household & misc.	_____
Work expenses (such as dues, tools)	_____

TOTAL fixed expenses $_____

Instructions: Show projected MONTHLY income during training period:

Income	Monthly
Wages from job	$_____
Public Asst.	_____
AFDC	_____
General Asst.	_____
Foodstamps	_____
WIN childcare	_____
Child support	_____
Benefits:	
Unempl. Ins.	_____
Veterans'	_____
Pension	_____
Disability	_____
Other	_____
Savings	_____
Loan (fam/friend)	_____
Pell Grant	_____

TOTAL Projected monthly income $_____

SUBTRACT YOUR EXPENSES FROM YOUR INCOME.
WHAT IS THE DIFFERENCE? _____

(OVER)

PROJECTED SUBSISTENCE BUDGET--page 2

The Gap, if any:

1. If your income total is larger, breath easier.
   Now, list any possible personal and/or financial problems that might arise.

2. What steps can you start taking RIGHT NOW to keep these from becoming problems, or to be prepared for them when they come up?

   List steps to take care of each problem:

3. If your expenses total is larger, what are your plans to deal with more expenses than income?

   List step by step plans to deal with this:

List all financial resources available to you (emergency funds you know about, family and friends, something valuable you can sell, ways to reduce any of your expenses, assistance you might qualify for RIGHT NOW, and so on.)

_____
Applicant signature, date

_____
B-FIT interviewer signature, date

GOALS:

1. What trade or trades are you considering?
   a. _____
   b. _____
   c. _____
   d. _____

2. Why do you want to participate in the B-FIT program and what do you plan to gain from it? (use additional space if necessary)

EDUCATION:

1. What is the highest degree or certificate you have earned? ____ None ____ High school diploma or GED ____ Some college ____ Technical certificate ____ Apprenticeship/military/vocational school ____ Associate degree ____ Bachelor's degree ____ Graduate degree ____

2. List all relevant courses: (Ex. math, woodworking, shop, p.e.)

VOLUNTEER AND UNPAID WORK EXPERIENCE:

List all your activities, beginning with high school. (Include such things as fixing electrical problems in your appliances or house, yard work and/or landscaping, doing your own car maintenance, etc.)

Example:

Activity car maintenance Length of time I've done this 3 years

What I did: changed oil and filters, changed plugs and points

1. Activity _____Length of time I've done this _____

What I did _____

2. Activity _____Length of time I've done this _____

What I did _____

3. Activity _____Length of time I've done this _____

What I did _____

4. Activity _____

What I did _____

5. Activity _____Length of time I've done this _____

What I did _____

6. Activity _____Length of time I've don this _____

What I did _____

ADDITIONAL EXPERIENCE: _____

_____

_____

_____

_____

SPECIAL QUALIFICATIONS:

Licenses held (now or in past; list whether current or expired): _____

_____

Union memberships (now or in past): _____

_____

Special courses/training/workshops: _____

_____

REFERENCES: (Please list the names, titles, and phone numbers of two non-family members who can speak to your character and qualifications)

_____

_____

(#16, wp, 5/19/89)

PHYSICAL INFORMATION:

_____Height _____Weight

_____Smoker _____Non-smoker

_____Drug/alcohol addiction (please explain)

_____Under treatment for any physical or emotional condition? (please explain)

_____Taking medication? (for what conditions?)

_____Physical limitations? (please list)

_____Allergies (please list)

_____Previous injuries (list dates and details)

_____Previous hospitalizations (list dates and details)

_____Previous worker compensation claims (list dates and details)

Personal Fitness: (Do you exercise: How often? What do you do?)

List any additional conditions, injuries, medical needs, handicaps, etc. which could have an effect on your class/job performance:

NOTE: WE RESERVE THE RIGHT TO REQUIRE A PHYSICAL EXAMINATION OR DR. APPROVAL TO PARTICIPATE IN THE PROGRAM.

(#14, wp2)

WORK HISTORY

DIRECTIONS: *List all of the jobs which you have held starting with your current or most recent job and work backwards.*

1

EMPLOYER		DATE STARTED	DATE ENDED
STREET ADDRESS	CITY	STATE	PHONE
JOB TITLE		HOURS PER WEEK	HOURLY WAGE $
BRIEF DESCRIPTION OF DUTIES AND RESPONSIBILITIES			
WAS THIS A JOB WITH AN EMPLOYMENT AND TRAINING PROGRAM? ☐ YES ☐ NO		WHY DID YOU LEAVE?	

2

EMPLOYER		DATE STARTED	DATE ENDED
STREET ADDRESS	CITY	STATE	PHONE
JOB TITLE		HOURS PER WEEK	HOURLY WAGE $
BRIEF DESCRIPTION OF DUTIES AND RESPONSIBILITIES			
WAS THIS A JOB WITH AN EMPLOYMENT AND TRAINING PROGRAM? ☐ YES ☐ NO		WHY DID YOU LEAVE?	

3

EMPLOYER		DATE STARTED	DATE ENDED
STREET ADDRESS	CITY	STATE	PHONE
JOB TITLE		HOURS PER WEEK	HOURLY WAGE $
BRIEF DESCRIPTION OF DUTIES AND RESPONSIBILITIES			
WAS THIS A JOB WITH AN EMPLOYMENT AND TRAINING PROGRAM? ☐ YES ☐ NO		WHY DID YOU LEAVE?	

4

EMPLOYER		DATE STARTED	DATE ENDED
STREET ADDRESS	CITY	STATE	PHONE
JOB TITLE		HOURS PER WEEK	HOURLY WAGE $
BRIEF DESCRIPTION OF DUTIES AND RESPONSIBILITIES			
WAS THIS A JOB WITH AN EMPLOYMENT AND TRAINING PROGRAM? ☐ YES ☐ NO		WHY DID YOU LEAVE?	

5

EMPLOYER		DATE STARTED	DATE ENDED
STREET ADDRESS	CITY	STATE	PHONE
JOB TITLE		HOURS PER WEEK	HOURLY WAGE $
BRIEF DESCRIPTION OF DUTIES AND RESPONSIBILITIES			
WAS THIS A JOB WITH AN EMPLOYMENT AND TRAINING PROGRAM? ☐ YES ☐ NO		WHY DID YOU LEAVE?	

6

EMPLOYER		DATE STARTED	DATE ENDED
STREET ADDRESS	CITY	STATE	PHONE
JOB TITLE		HOURS PER WEEK	HOURLY WAGE $
BRIEF DESCRIPTION OF DUTIES AND RESPONSIBILITIES			
WAS THIS A JOB WITH AN EMPLOYMENT AND TRAINING PROGRAM? ☐ YES ☐ NO		WHY DID YOU LEAVE?	

EQUAL OPPORTUNITY / AFFIRMATIVE ACTION DISCLOSURE

The information contained on this page will be kept confidential and will not be used to discriminate against potential applicants. Your assistance in this is requested.

Mark the category that you feel best fits you:

_____ American Indian/Alaskan Native

_____ Asian or Pacific Islander

_____ Black

_____ Hispanic

_____ white

Check One:

_____ Male

_____ Female

Date of Birth: _____
Month Day Year

6/2/89
(#13.wp2)

Portland Community College

PHYSICAL EXAMINATION REPORT

(Mr.)
(Miss)
Name: (Mrs.) ..... Social Security No. .....
(Last) (First) (Middle)

Address: .....

Phone No.: ..... Birthdate: ....
(Month) (Day) (Year) (Age) (Height) (Weight)

Married ..... Single .....

TO BE COMPLETED BY PHYSICIAN:

The above-named person has been examined by me, and I recommend the following physical activity program. (Physician, check appropriate line.)

..... Unlimited—No restriction in exercise, sports, and athletic programs.
..... Restricted—(Specify what must be omitted.) For how long? .....
..... Prohibited—Until permission is given, no exercise or sports program can be carried on.

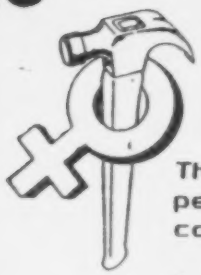
Physician's Remarks: .....

.....

.....

Physician: ..... Date Examined: .....

Address: ..... Phone No.: .....



B-FIT
Building Futures in Industry & Trades

JOB INTEREST SURVEY

The following questions are designed to help you focus on your personal likes and dislikes concerning working conditions in the blu collar trades. Answer as honestly as you can.

1. Do you like physically moving around on a job (___) or sitting/standing in one place (___) or a mixture (___)?

2. Which do you like better, working inside (___) working outside (___) or some of both (___)?

3. Do you mind working at heights? Yes (___) No(___)

4. Do you enjoy driving? Yes (___) No (___)

5. How many miles are you willing or able to travel to a job site? Less than 20 miles (___) 20-50 miles (___) 50-100 miles (___)

6. Which do you like better, working as part of a team (___) or working on your own (___)?

7. Can you stand constant noises? Yes (___) No (___)

8. Do you prefer doing fine, intricate work (___) or work that use: your whole body (___)?

9. Do you feel comfortable working with tools? Yes (___) No (___ some tools (___)

10. Which of the following schedules would you be willing to work? (check as many as apply.)

Night work	(___)	Seasonal work	(___)
Changing shifts	(___)	Long hours(for more than eight hours per day	(___)
Overtime	(___)		

11. Would you feel uncomfortable sharing restroom facilities with male co-workers? Yes(___) No(___)

12. Do you like doing puzzles and figuring out problems? Yes (___) No (___)

13. If money were no problem what is the maximum amount of time you would be willing to invest in an apprenticeship or other trainir program?

Less than one year	(___)	One to two years	(___)
Three to four years	(___)	Five years	(___)

14. Which do you like better, fixing things (___) or creating new things (___)?

B-FIT
Building Futures in Industry & Trades

QUESTIONNAIRE

1. What do you think of when you think about trades work? What words come to mind?

2. What are some of the difficult aspects of trades jobs?

3. What would be the most satisfying part of doing trades work?

4. What kind of person does best in trades work? What kind of background should you have?

#37

B-FIT

Building Futures in Industry & Trades

MYTHS AND FACTS ABOUT BLUE COLLAR, NON-TRADITIONAL WORK

1. Employers complain that most women lack sufficient upper body strength. agree disagree

2. One of the easiest jobs for a woman to get and hold is that of a flagger on highway projects. agree disagree

3. The average starting pay for blue-collar jobs is $13.00 per hour. agree disagree

4. When you go for a non-traditional job interview, you should wear your best clothes, just as you would for any other job interview. agree disagree

5. Non-traditional work helps women lose weight. agree disagree

6. Most people can get into good physical shape in 4 to 5 weeks. agree disagree

7. If you work hard and do your job well, the men on the job will like you. agree disagree

8. It's easy for a woman to get a non-traditional job because most employers now have quotas agree disagree

9. Non-traditional work is steady and secure, with good benefits. agree disagree

10. These days there are enough laws to make working conditions safe and clean on non-traditional jobs. agree disagree

11. One nice thing about non-traditional work is that on sunny days you can wear a halter or shorts while you work. agree disagree

12. On a non-traditional job, if your supervisor asks you to do something and you are afraid or unprepared, you can just tell them the problem and they will give you something else to do. agree disagree

13. If you love nature and the outdoors, non-traditional work is a good choice for you. agree disagree

Registered Apprenticeship Programs in Oregon

1. Appliance Repairer
2. Asbestos Worker
3. Audio, Video Repairer
4. Auto Body & Fender Mechanic
5. Automotive Machinist
6. Auto Mechanic
7. Auto Painter
8. Auto Mechanic-Air Cooled Engines
9. Assistant Manager (Forester)
10. Baker
11. Boilermaker (Construction & Repair)
12. Boiler Operator
13. Bookbinder
14. Bricklayer
15. Bricklayer Helper
16. Business Deparment Manager
17. Car Builder
18. Carbide Saw Smith
19. Carpenter (Industrial)
20. Carpenter (Residential/ Commercial)
21. CATV Lineman
22. Cabinetmaker
23. Cement Mason
24. Choke Setter
25. Cook (Broiler/Roast Cook)
26. Cook (Culinarian)
27. Cook (Fry Cook)
28. Cook (Pastry Cook)
29. Concrete Finisher
30. Construction Laborer
31. Dental Technician (Denture)
32. Diemaker, Diecaster & Plastic Molding
33. Diesel Engine Mechanic, Marine
34. Diesel Mechanic
35. Drywall Applicator & Related Acoustical
36. Electrician
37. Electrician, Sub-station
38. Electrician Estimator
39. Electrical Meter Repairer
40. Electrical Repairer
41. Electric Motor Winder & Repairer
42. Electronics Technician
43. Environmental Control Systems Servicer
44. Exterior and Interior Specialties (Drywall)
45. Extrusion Die Maker
46. Extrusion Die Corrector
47. Farm Equipment Mechanic
48. Faller (Logging)
49. Fire Fighter
50. Fire Medic
51. Forester
52. Forest Worker
53. Forest Aid-Crew Leader
54. Front End Mechanic
55. Furniture Finisher
56. Gas Welding Equipment Mechanic
57. General Supervisor (Forestry)
58. Glass Installer (Auto)
59. Glazier (Construction)
60. Grinder Set-up Operator
61. Gunsmith
62. Hearing Aid Technician
63. Heavy Duty Bus Mechanic
64. Heavy Duty Truck Mechanic
65. Heavy Equipment Mechanic
66. Industrial Electrician
67. Industrial Air-Conditioning & Refrigeration Mechanic
68. Industrial Blacksmith
69. Industrial Carpenter
70. Industrial Instrument Repair
71. Industrial Painter
72. Industrial Pipefitter
73. Industrial Machine Operator
74. Industrial Mobile Equipment Mechanic
75. Inhalation Therapist
76. Ironworker
77. Inside Electrician
78. Instrument Mechanic
79. Laborer
80. Land Inspector (Forestry)
81. Letterpress Operator
82. Limited Energy Electrician
83. Limited Energy Technician
84. Limited Journeyman Sign Electrician - Sign Erector
85. Limited Residential Electrician
86. Line Installer/Repairer
87. Locksmith
88. Machinist
89. Maintenance Machinist
90. Maintenance Machinist (Industrial)
91. Maintenance Mechanic
92. Maintenance Mechanic (Food Processing & Freezing Equipment)
93. Maintenance Mechanic (Wood Products)
94. Maintenance Mechanic (Industrial)
95. Millwright (Construction
96. Machine Driller Operator (Forestry Access Road Construction)
97. Manufacturing Plant Electrician
98. Manufacturing Jeweler
99. Master Maintenance Mechanic
100. Meatcutter
101. Metal Trades Pipe-fitter Meterman
103. Meter Installer/ Repairer
104. Millwright
105. Millman & Cabinetmaker
106. Molder

FINANCIAL AID RESOURCES - B-FIT
90-91 ACADEMIC YEAR
PORTLAND COMMUNITY COLLEGE

The B-FIT program is not responsible for processing financial aid applications for program applicants.

To make application, contact the Rock Creek financial aid advisor, Charlene Carter, Building 2 Room 122, 244-6111 ext.7216.

1. Financial aid resources available through Portland Community College.

   A. Federal Financial Aid
   B. Pell Grant Awards
   C. Student loans

2. Tuition deferrment plan/deferred notes installment paying

   A. Contact the Business Office, see attachment.

   All financial awards will be made according to individual eligibility and not because student is registering for the B-FIT program

3. PCC Foundation Grants

   Contact Foundation Office for information about special grants. 244-6111 X 4382

#67.wp

ADULT AND FAMILY SERVICES ELIGIBILITY
for B-FIT Students

Aid to Dependent Children (ADC) is a program that provides cash and medical benefits to needy children and their parents, when one of the child's parents is absent, incapacitated, or unemployed. This program may be able to help B-FIT students pay for basic household expenses while they attend school.

AFS also has JOBS program for persons who are receiving ADC. The JOBS program may pay for a B-FIT student's day care, transportation, and other expenses while they attend school.

How does a student obtain ADC and JOBS benefits?

IF A B-FIT STUDENT IS NOT AN ADC CLIENT, the student should do the following:

Contact their local AFS branch and ask to apply for ADC assistance. The student will be given instructions how to apply for assistance. The application procedures will include an orientation appointment, and an eligibility determination appointment. If the student is eligible, ADC benefits will be paid within 45 days of the day she requested assistance.

Once the student is eligible for ADC, the student will be given an appointment for JOBS orientation and screening. At the screening, the student should inform the screener she is a B-FIT student. Should the student be accepted into the JOBS program, AFS will help pay for the student's day care, transportation, and non-educational expenses.

IF A B-FIT STUDENT IS AN ADC CLIENT, and wishes to receive AFS support services payments while they are attending B-FIT, the student should do the following:

Contact their on-going AFS worker, tell the worker they are attending the B-FIT program, and request support payments for childcare, transportation, or other support service need.

The worker will arrange to have the student screened for the JOBS program. Should the student be approved as a fully supported JOBS participant, AFS will help pay for day care, transportation, and other non-educational expenses.

#173.wpdoc

B-FIT Recommendation and Referral Form

Applicant Name _____ Date _____

Interviewer Name _____

Outstanding needs or barriers that might prevent applicant from entering the B-Fit program at this time: _____

Recommendations for Applicant's readiness to enter B-FIT: _____

Referrals (specify name & phone number): _____

(#24, wp, 5/23/89)

B-FIT INTAKE ASSESSMENT FORM

Applicant name _____ Date _____

Interviewer's Name_____

1.	Healthy, Physically Fit	1	2	3	4	5
	Comments:_____					
2.	Demonstrated non-traditional background or aptitude	1	2	3	4	5
	Comments:_____					
3.	Demonstrated commitment to complete course	1	2	3	4	5
	Comments:_____					
4.	Employment readiness after B-FIT	1	2	3	4	5
	Comments:_____					
5.	Reasons for entering trades:	1	2	3	4	5
	Comments:_____					
6.	Overall employability potential	1	2	3	4	5
	Comments:_____					
7.	Math skills rating	1	2	3	4	5
	Comments:_____					
8.	Reading skills rating	1	2	3	4	5
	Comments:_____					
9.	Life issues under control:	1	2	3	4	5
	Comments:_____					
10.	Outstanding needs/barriers:	1	2	3	4	5
	Comments: _____					

B-FIT
INTERVIEW QUESTIONS

1. Why do you want to enter the trades and what are your goals after completing the B-FIT program?

2. If you are selected for the program, how do you plan to handle your budget during the six to nine months between entering the program and becoming employed in the trades?

3. What barriers or hurdles do you have, if any, that would get in your way of finishing the six month training program? What are your plans for overcoming these barriers?

4. Interviewer describes situation. Asks interviewee to respond.

   "You are assigned to an apprenticeship position in the trades. You find yourself having difficulty with a co-worker or possibly your supervisor."

   "Describe the behavior of this person that is causing the problem."

   "What steps would you take to respond to the situation?"

5. Ask additional questions concerning the completed application, particularly incomplete sections, reasons for leaving employment, personal difficulties or health problems listed by the applicant.

NOV 7 RECD

PROGRAM FOR WOMEN SEEKING NON-TRADITIONAL CAREERS

By Carole Anderson

Portland Community College has received a $312,000 federal grant designed to increase the success rate of women entering apprenticeships and non-traditional employment.

Resulting from a high level of cooperation between private industry and public agencies, the Women in Education for Apprenticeship and Non-Traditional Employment (WEANTE) program will recruit, train and place women in a wide range of non-traditional occupations.

"We are optimistic that this program will help break down the barriers that traditionally have prevented women from succeeding in non-traditional careers," said Daniel F. Moriarty, president of PCC.

"The under-utilization of women in the workforce is not only a gross injustice to half our population, but also a tragic waste of a valuable human resource," he said. "This project represents the best of what can happen when business, industry, government, and education work together to address a problem too complex for any entity to solve alone."

The U.S. Department of Labor reports that in 1987, only 3.4 percent of Oregon's apprentices were women.

"It's still a rarity to see females in non-traditional jobs," said Charles Ganter, chairman of the WEANTE advisory board and training director for Freightliner. "With the projection of 80 percent of the workforce in the year 2000 being minorities and females, many of us in the apprenticeship community recognize the need to help women develop the skills needed to qualify for and succeed in these kinds of jobs."

Carl Sorensen, Oregon director of the Bureau of Apprenticeship and Training, initiated the project and formed an advisory board to investigate funding sources.

After much research, the group decided to pattern its program after a model apprenticeship program for women in Renton, WA., with a few modifications. Sorensen contacted PCC to discuss funding options, and the college succeeded in getting the grant.

> "It's important to accept women's changing roles without putting down past roles."

With its broad base of support, WEANTE takes a multifaceted approach to helping women succeed in non-traditional employment and meeting labor force needs.

Participants will receive a total of 660 contact hours of training in basic skills for the construction, mechanical, and electrical trades; life skills; job search skills; strength building; first aid; microcomputer skills; and transitional worksite training.

Advisory board member Dan Faddis, training director at Metro Electric, stresses the importance of the physical training component of the program.

"The biggest problems women face in our industry are the physical requirements for heavy construction," he said. "We think this is a good way to prepare women to enter the non-traditional world of work."

"I believe this program will be a positive force in blurring the stereotypical view we have of 'women's work,'" said Labor Commissioner Mary Wendy Roberts. "Women possess the skills and the knowledge and the drive to be successful in occupations traditionally held by males."

The new program includes a number of unique components designed to help women succeed. Seventy percent of the women who participate will be guaranteed jobs, providing the economy remains stable. There will be no low-income requirements. Women

will have the benefit of a trouble-shooter or mentor. Participants will have ample hands-on, worksite experience.

The grant-funded portion of the program includes two training sessions. The first was scheduled from May through September of 1989; the second operates from mid-October of 1989 to the end of March, 1990.

Women already in the construction field are upbeat about non-traditional career opportunities. Maxine Pierce, owner and president of M-R Pierce Construction, Inc., started a construction business in 1981 with two of her sons.

"I didn't have an opportunity when I was younger to get out in the business world and learn," she said. "My granddaughters are learning they don't have to spend their lives in the kitchen if they don't want to. They have other options."

"I think it's important to accept women's changing roles without putting down past roles," she said.

Gail Smith, director of sales and marketing for Adair Homes, Inc., has worked in all facets of the housing construction industry over the past 15 years. Although she has a teaching degree, she decided to pursue a career in construction.

"I grew up in a family involved in building, so I have it in my blood," she said.

"Women do well in this business. We're very conscious of details and very well organized."

She sees the construction industry as a good career path for women.

"The work is good for women who do not want to be confined to a single location," she said. "Many women like more active work. And they can make a lot more money."

Smith described the satisfaction of learning a specific trade or physical skill. "The work is interesting and there are a whole range of opportunities."

Carole Anderson is Director of Community Relations, Sylvania Campus, Portland Community College.

Continued from p. 20

and a half visit with Royal Shakespeare Company actor, Tony Armatrading. The students enjoyed the candor, theatrical sense, and warm personality of the actor they had seen performing the role of Banquo in an RSC production of Macbeth.

Numerous benefits flow to both students and teachers who participate in this Oregon London program. Among the advantages for students is the opportunity to become acquainted with students from other colleges and universities. In both academic and co-curricular areas, students gain an international exposure by virtue of studying in one of the world's major capitals. London itself and the surrounding area to which students are introduced become classroom and laboratory for students and their teachers. All the cultural opportunities facilitated by AIFS--excursions to Parliament, the law courts, evening walking tours, day trips to Canterbury, Oxford, Bath, and Stratford--augment classroom instruction. The benefit of cultural immersion is invaluable, of course. Our students did not visit London, they lived there. They used the Underground system daily; they had to adjust to several Tube strikes; they played softball with teams made up of production crews from popular West End shows like Les Miserables and Phantom of the Opera; they visited Wales, Ireland, Scotland; they frequented London's museums and concert halls. For all of our Oregon students, leaving London meant separating from new found friends and saying a difficult "good bye" to a wonderful experience in learning and in life.

Eric Hoem is an instructor in the Literature and Comoposition Division at Mt. Hood Community College. He and Mary Forestieri served as instructors for the 1989 London Quarter Program.

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Non-traditional careers

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Discrimination against women seen in engineering classrooms

Gannett News Service

WASHINGTON — When Marilyn Berman, associate dean of engineering at the University of Maryland, met recently with local high school girls interested in engineering and asked why more weren't there, she heard "appalling stories."

If their school only offers one physics course with 20 places, the teachers say it's more important for the boys to take it. Girls get whatever is left.

And peers, school counselors, even parents actively discourage them from taking calculus or other advanced math, telling them it's too hard and they won't need it anyway.

Berman said the country was "backsliding" on efforts to attract women into non-traditional careers. "Universities can't do it alone," she said.

Such stories illustrate the quandary engineering schools face these days, particularly at the graduate level, where foreign students routinely make up more than half of doctoral candidates. U.S.-born women and minority students are barely more than a handful.

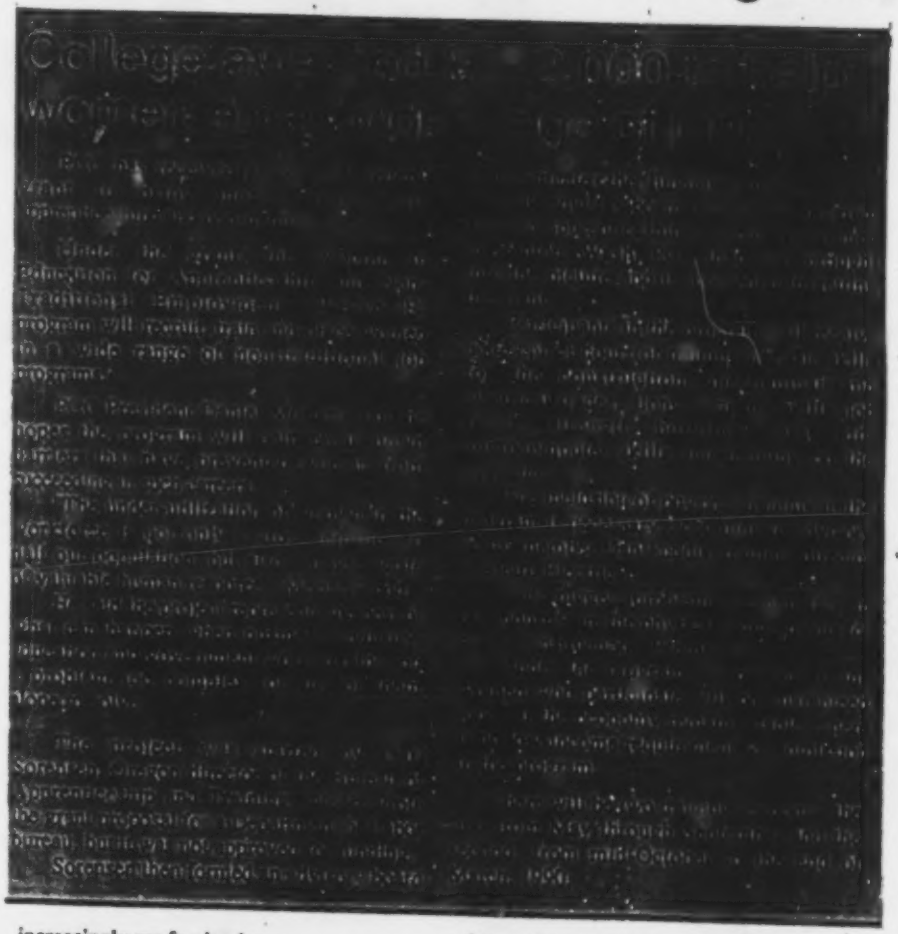
The picture is somewhat better at the undergraduate level, where just over 2 percent of 1975 graduating classes were women, compared with 15 percent a decade later.

But there are signs that proportion is dropping.

Popular television programs such as "L.A. Law" are said to have increased the number of young women going to law schools, a traditionally male preserve, said Robert Page, who holds the endowed Forsyth chair of mechanical engineering at Texas A&M University.

"We don't have any programs like 'L.A. Engineers,'" he said.

Engineering educators say a key to attracting women and minorities lies in having role models on college faculties. But faculties are drawn from the ranks of those holding doctoral degrees in engineering, who increasingly are foreign born.



A study by the National Research Council, an arm of the National Academy of Sciences and National Academy of Engineering, found that by 1985 more than half of all assistant professors under age 35 were not U.S. citizens. Disproportionately large numbers come from the Far East, India and the Middle East, with sharply different cultural backgrounds from those of the undergraduates they teach.

More than language difficulties are at issue, the educators say, although language problems can be severe.

"If a professor is Middle Eastern and believes women should be veiled and barefoot, then it's going to come through in the classroom," Berman said.

No one has systematically studied cultural discrimination in engineering classrooms, but some educators are convinced it is a factor in discouraging women and minority undergraduates to the point where they switch majors.

Foreign faculty members, often brilliant engineers, do not provide the role models necessary to attract and keep women and minority students, Page said.

But with so few women and minority engineering students seeking advanced degrees, "it's very difficult to have an effect on the cycle," Page said. "No one has figured out how to solve it."

One of the ironies is that engineering graduates with bachelor's degrees can command starting salaries of $28,000, more than double what a graduate assistantship would pay.

And many companies will pay employees to work part time on graduate engineering degrees, eliminating incentives for students to pursue full-time academic work or professorships.

Foreign engineering students, by contrast, come to the United States specifically to pursue graduate work unavailable in their homelands.

Berman said there was no doubt the United States had benefited from the influx of foreign engineering graduates. But she and other educators say they must continue to recruit untapped U.S. talent into engineering, starting with efforts to improve math and science education in elementary and secondary schools.

U.S. women and minorities, the fastest-growing segment of entrants to the U.S. labor market, constitute "a significant talent pool that is not being tapped," Berman said. "That's really a negative for our society."

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B-FIT takes direct aim at opening industry doors to women

In an effort to check the nation's looming labor shortage crisis and help motivated women find higher paying jobs in industrial occupations, a coalition consisting of AGC, the U.S. Department of Labor, labor unions, employers and Portland Community College launched the "Building Futures in Industry & Trades," program at PCC's Rock Creek Campus last week.

Nicknamed "B-FIT," the federally funded demonstration program with PCC matching funds, stems from a growing awareness in recent years by the Bureau of Apprenticeship and Training, the Bureau of Labor and Industry and several regional apprenticeship program coordinators that the number of women applying for apprenticeship positions is extremely small and steadily declining.

To reverse the trend they set about designing strategies to increase female participation in apprenticeship programs and formed an advisory board comprised of concerned citizens from the business community, various apprenticeship programs and public service agencies.

The board's task was clear, to facilitate the transition of women into apprenticeship programs and other non-traditional occupations by means of a program which provides industrial skills training, physical-fitness training, shop course work, transitional worksite training and support groups to provide encouragement and ensure retention.

"The B-FIT course is designed to help women enter apprenticeship programs in construction related mechanical and electrical trade fields," says Gail Smith, the program's director of operations and a 16 year veteran in the construction industry.

"Over 200 women came to our 40 initial orientation meetings. Of that group, 130 women completed the full application process. We eventually selected 52 women for the first course. The remaining women have the opportunity to attend the next course in January or to be re-evaluated."

"We maintained a rigorous selection process that searched for a very definite profile," says Smith. "We wanted strong women, leaders, women capable of opening doors for others in the future. B-FIT is a pilot program and we'll be judged by our first graduating class. The initial group is blazing a trail for all women interested in non-traditional occupations and we wanted them to have the right stuff."

Dan Saltzman, PCC board member, compares the B-FIT women to Rosy the Riveter, symbolic industrial heroine of World War II.

"If successful, the B-FIT program will provide a blueprint for other communities to follow to reverse the sharp decline of women in skilled trades and their lopsided concentration in lower paying service and clerical jobs.

"We all have an interest in eliminating inequities associated with the concentration of

See B-FIT, Page 18

Judy Campagna, an electrical/mechanical B-FIT instructor, waits while students complete their first class quiz during day one of the all-women trades training program at P.C.C.'s Rock Creek campus.

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John Fulton, B-FIT construction instructor (left), Gail Smith, program director, Marjorie Carson, associate dean of business and industry for PCC's Rock Creek campus, and Jim Van Dyke, executive dean of the campus, are optimistic about B-FIT's role at incorporating women into higher paying industrial jobs.

B-FIT Continued from Page 17

women in lower paying occupations. The Labor Department's Workforce 2000 study notes that the aging workforce and declining birthrate will produce a shortage of workers unless those groups that have been traditionally underutilized enter the labor pool."

"The college has a lot at stake in the program," says Smith. "If we are successful, they will be able to offer more short term, intensive training programs that prepare workers to enter new fields. Today's economy demands that workers be trained quickly and cost-effectively and the community college system is well-positioned to accomplish the task."

The first group of B-FIT women range in age from 18 to 49, with an average age of 30. Educational backgrounds range from high school dropouts to college graduates. The group's total combined paid work experience is 305 years. Some 70 percent of the students are the major or sole support of their immediate family.

"It is obvious that education doesn't do much to boost the earnings of women," says Smith. "The average earned wage of this group prior to the program is only $5.62 an hour. According to federal labor statistics, a woman with 16 years of education makes the same as a man with only an eighth grade education.

"Upon graduation, we will place the women into training positions that begin paying about $7 an hour. The program is designed to get them jobs that will eventually pay anywhere from $10 to $17 an hour.

"Each student fits a non-traditional profile, a specific quality we looked for in the applicants. They also had to demonstrate a solid plan of action for taking the five month, five day-a-week class. Many of the women have made difficult personal sacrifices to be a part of the program. While the course is free, students don't earn a wage."

"Many are holding down weekend jobs, some have scholarships, others are receiving family support. Mothers in the program are taking care of their own childcare arrangements. Adult and Family Service is because they didn't know how to go about it or didn't have the overall basic skills to qualify for an apprenticeship program. When this group graduates in December, they'll be better qualified than most beginning apprentices."

B-FIT's comprehensive course outline for basic skills include trade math, blueprint reading and drawing, personal and construction safety, use and care of hand and power tools, heavy repetitive tasks, and an introduction to welding.

In the area of electrical and mechanical skills, students will learn all about electricity and electronics, electro-mechanical devices (theory and uses), plus practical application and troubleshooting.

Students must also complete 90 hours of shop or practical experience. Subjects are picked from an extensive list that includes everything from ditch digging and scaffolding erection to steel grinding and oxy-acetylene cutting and welding.

The course also provides instruction in life skills, including career planning, sexual harassment and assertiveness training; job search skills, including

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Oregonian , August 25, 1989

Training Rosies for City of Roses

By DAN SALTZMAN

IN MY OPINION

Rosy the Riveter — the symbolic heroine of World War II — is about to return to the Portland work force.

A partnership of labor unions, employers, social service agencies and Portland Community College is behind a federally funded demonstration program to increase the number of women in high-paying skilled construction, mechanical and electrical trades.

If successful, the "Building Futures in Industry & Trades" program will provide a blueprint for other communities to follow to reverse the sharp decline of women in skilled trades and the lopsided concentration of women in lower-paying service and clerical jobs.

While World War II brought about a most profound increase in opportunities for women to train and work at skilled trade and industry jobs, it was unfortunately also the high-water mark. Over the past six years, in Oregon and the nation, the number of women applying for apprenticeship positions has been extremely small and declining rapidly. In 1987, only 3.4 percent of Oregon's apprentices were female, down from 5.9 percent in 1986.

We all should have an interest in eliminating inequities associated with the concentration of women in low-paying occupations and their limited access to broader opportunities to provide adequate family support. Despite efforts to close the earnings gap, women place shockingly lower in wage level than men — averaging 44 cents for each dollar earned by men in 1984. Yet, the number of families maintained by women is growing rapidly and increased almost 90 percent between 1970 and 1985. This phenomenon led one national advisory commission to the dire prediction that female-headed families would comprise 100 percent of the poverty population by the year 2000.

This prediction need not come true if we have a robust economy and the commitment to provide specialized training and assistance for women to enter and to succeed in the trades.

The economy is doing its part. The U.S. Department of Labor predicts that carpenters and electricians are in the top 30 occupations that will have the largest projected job growth through 1995. The Labor Department's "Work Force 2000" study notes that the aging work force and the declining birth rate will produce a shortage of workers unless those groups who have been traditionally underutilized enter the work force.

Clearly, there will be jobs for women in higher-paying, male-dominated trades. Just as clear, however, is that they will be unable to take advantage of the opportunities without appropriate training. That is where the Building Futures in Industry & Trades program comes in.

Its focus and intent is to demonstrate that cooperation among the private sector, public agencies and a community college can overcome obstacles women face in work in the trades; recruit, train, and place women in skilled trade and apprenticeship positions; and enable them to succeed.

The 18-month program funds two five-month sessions at PCC for 50 women each. The sessions are seven hours a day, five days a week.

Unlike similar programs, the local demonstration program targets a wide spectrum of women, not just those of low income. Each applicant will have a personal interview and a skills assessment before admission. Those not admitted will be referred to advisers at PCC for guidance into other non-traditional or traditional, higher-paying career programs.

The program's comprehensive approach goes beyond the teaching of basic trade skills. It includes building basic reading and math skills; tutoring to meet entry-level apprenticeship program qualifications; physical strength-building; computer and hazardous materials training; hands-on work-site experience in the accomplishment of a charitable project; preparation for job interviews; and a support group of women working in trades to provide job networking, problem solving and support. During the participant's first three weeks on the job, a troubleshooter from the program acts as a mentor to reduce problems for both employee and employer.

Two reasons Portland was selected for federal funding are the substantial in-kind contribution of teachers and equipment provided by PCC and the commitment of unions and employers to guarantee that at least 70 percent of the program's participants will have jobs upon completion.

We are optimistic that the first 100 graduates of this program will be but the first wave, securing higher-paying jobs and fighting poverty with the same dedication Rosy the Riveter brought to winning the war.

Dan Saltzman is president of Environmental Management Solutions of Portland and is on the Portland Community College board of directors.

In B-FIT, these women learn skills of a trade

By REBECCA BUTTERWORTH
Staff Writer

Remember when some folks used to say a woman's place was in the home.

Now, with the help of training under way at PCC's Rock Creek Campus, a woman's place might well be on a construction site.

A group of nearly 50 women is midway through a five-month program designed to teach them about non-traditional trades such as construction work and to help them attain the physical strength needed to perform these jobs alongside men.

The program is known as "B-FIT."

These women trainees learn everything from Ohm's Law to sheet metal sizing.

In the classes the trainees work together as a whole unit striv-ing for the knowledge that this program gives to them.

Trainee Robin Barker explained: "Women work together --a sisterhood type thing, it's not just me alone but all of us, and the competition is against me; to better myself."

Eilen Beveridge calls it "a united front for women."

B-FIT offers free tuition, supplies and textbooks under a $315,000 federal grant.

Trainees first are given an orientation to determine if they wish to enter the program. Then they are counseled and are given a personal interview to assess their skills and interests.

Chris Brunkhart photo

Alex Kearny, foreground, practices to improve her proficiency with hammer and nails

During the program, the women receive 245 hours of work on electrical and mechanical basic skills and about 230 hours of trades basic skills. In addition, they devote time to physical strength-building, life skills such as communication, problem solving and goal setting, and job search skills.

They learn CPR and first aid, are introduced to microcomputers and they spend 50 hours training on worksites.

Classes begin at 8 a.m. and e at 3:30 p.m., Mondays throu Fridays.

Sallee Walters, a mother two grown children, said "whe heard about the program on TV was like a light shining throug door. I feel positive doing thi with my hands and seeing what I made."

In one of their classes, the Fit trainees gather in a sheet-me workshop in groups of four or fi Each group is given a discussi topic, such as the types and sizes wires. Each member will pres information and instruct others the group about the topic.

"We plan models and dem strate them to class; show th what it looks like," said Walters.

"We are just getting start The more we learn is fun a exciting."

Such demonstrations "allow to experience all kinds of differe projects and find more areas interest," Walters said.

This first class is a pil program and its success will be, part, determined by the success its graduates, says Shirley Fugere, program secretary.

Walters says this class involved in working out all t "bugs" and smoothing the path f future classes.

"We're pushing for 100 perce

(Please Turn to Page 1

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short-term training programs. Employers are reimbursed for part of the trainees' wages.

Coryell also contacts potential employers and matches their specific needs with participants in the program.

The diversity of job placements attests to the consortium's success at developing innovative solutions to difficult employment problems in Washington county.

The U.S. Departmentof Labor reports that in 1987, only 3.4 percent of Oregon's apprentices were women.

In response to this disturbing statistic, Portland Community College, private industry and public agencies saw an urgent need to help women enter male dominated occupations and close the earnings gap that has made them the majority of Americans with incomes below the poverty level.

will work with industry and apprenticeship programs to place its graduates in on-the-job training positions, Smith said.

said.

"Some of the students come in on their own," she noted. "They realize that computers are going to be the future. They don't know anything about them, and they want to, but they don't have a schedule that fits with the times our lecture courses are offered."

(continued on page 4)

Kim Post

Kim Post, 26, married and the mother of two children, learned about B-FIT (Building Futures in Industry and the Trades) while taking construction courses at PCC's Rock Creek Campus, where she was the only woman in her class.

"I was shocked to return to school after eight years and find all men in the class," she said. "I thought, where are all the women? Did they join the secretarial pool? Come on! This is the '80s."

Thus, a course for women in construction sounded great.

Post plans to specialize in kitchen and bath renovation when she completes her training. Looking for ways to do her own kitchen remodeling originally brought her to PCC.

"I really think it is great," she said, of the B-FIT program. "It is like being out on a job. We are thrown together and have to learn to work as a team."

If Owen and Post are examples of all the other women currently enrolled in B-FIT, the Portland building community is in for a constructive surprise.

Jefri Owen

Jefri Owen read about PCC's B-FIT program, Building Futures in Industry and The Trades, in "The Oregonian" the same day her mother saw a television program featuring B-FIT.

The single parent of three children had recently quit her job as a woodworker because of low wages and a lack of upward mobility. She was looking for a college program when she heard about B-FIT.

"I have learned so much already," the future electrician said, taking a break from Judy Compagna's electrical/mechanical class.

"I have no doubts about finding a job when I graduate," she said. Owen expects to earn about $6.73 per hour when she starts her electrician apprenticeship training, the most money she will have earned in her life. Eventually, she expects to make as much as $20 an hour.

Owen, who drives from her home in Vernonia to attend classes, hopes to remodel the big farm house in which she and her nine brothers and sisters were reared. The house is in need of extensive repair and now sits empty. She will have plenty of help from her construction-oriented family.

She is looking forward to a supervisory position after she gains sufficient experience in the field. She said she has taken a lot of orders in her time and would like to try giving some for a change.

B-FIT students ▲ Kim Post and ► Jefri Owen

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B-FIT women graduates complete training program

Oregon's construction industry got an enthusiastic shot in the arm as nearly 40 dedicated, hard-working and thoroughly prepared women entered the work force.

The B-FIT (Building Futures in Industry & Trades) program marked the completion of its first phase last Tuesday at graduation ceremonies held at Portland Community College/ Rock Creek Campus.

The program is a federally-funded partnership with PCC and the trades aimed at bringing more women into the traditionally male-dominated construction industry. Demographic realities facing the trades in this last part of the 20th Century are demanding such programs.

Fully two-thirds of the new entrants into the work force in the next decade will be women, and with construction in Oregon already using every skilled person it can, this program has been closely followed and praised by many.

"We thank all of you for your hard work, your dedication and the spirit with which you have embraced this program," said Charles Ganter, chair of the B-FIT Advisory Board. "We know you will continue this dedication as you enter the trades."

Ganter was followed by Dr. Dan Moriarity, president of PCC, who spoke of the importance of the academic-industry partnership embodied in the B-FIT program. He also encouraged the women to keep education as their focus as they progress through the trades.

Special program awards were then handed out by Carol McCann, the programs physical conditioning instructor. One of the key ingredients to the program was a rigorous, physical conditioning regimen.

The first graduating class of B-FIT women are ready to go to work. Some 40 trainees and instructors celebrate completion of the six-month training program providing the select group of women with necessary skills to enter trade apprenticeships.

"A lot of this program is about giving women the confidence that they can do this type of work, that they can succeed," says McCann. "Physical well-being and conditioning is a great tool for self-esteem. These women now have confidence in their abilities and their physical stamina."

Some of the women made outstanding progress, increasing their total strength by over 70 percent during the course of the program This type of dedication was the standard for all the women in all aspects of the program.

"This was one dedicated group of women," said John Fulton, carpentry skills instructor for B-FIT. "They saw this program as a real opportunity, they dedicated themselves, they went for it. I am proud of every one of them. Exceptional students. They will make a real contribution to any firm hiring them."

The group makeup was diverse with some women coming as far away as Molalla and Veneta to attend classes which began at 7 a.m. each day.

There were 76 children between the women and over 70 percent of the participants held down jobs outside their full classload schedules. There were also nine women with perfect attendance, making it every Monday-Friday for six months.

The majority of the women have already lined up some industry connection and will be continuing their work as apprentices. In fact, some women were absent from the ceremonies as they were already on the job.

"This is not an end," said Gail Smith, program director. "Another group of women will begin "B-FIT II" in early January. We are also dedicated to following up with this first group of women, helping them with continued training and job placement. I can't wait to see some of these women in two or three years and see what kind of an impact they've had on the trades.

"The industry needs to recruit good women, and these women are some of the best. They will be excellent role models for women in the future," she said

"It's tough to say goodbye to this group," says Fulton. "They've set an awfully high standard for the next group. And I'm sure I'll be hearing from these women in the future. We all will."

The women honored for their participtaion in B-FIT were:

Patricia Adamson
Trudie Dunbar
Kathryn Sayles
Tamara Baker
Carol Green
Alice Scheer
Robin Barker
Cathy Harner
Ingrid Shorey
Sherryne Battilega
Donna Hough
June Solomon
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Cindy Stephen
Viola Bryant
Susan "Alex" Kearny
Julianna Tamerius
Janet Burchell
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Shannon Case
Sharon Parks
Kristen Terry
Gena Cervera
Dora Patterson
Debi Umscheid
DeeAnne Chamberlain
Debbie Patton
Darlene Vinson
Syble Corey
Kimberly Post
Caryn Walker
Laura Davidson
Tonja Riegle
Karen Ward
Sallee Waters

Mr. T meets long, tall Stan — A Dramatization

Opinion by Chuck Sides

It really isn't very glamorous, this business of holding state office. Take the example of Ted "Mr. T" Kulongoski, our state's Insurance Commissioner.

Mr. T recently issued his "Impaired Rights Manifesto" to the State Accident Insurance Fund (SAIF) and its president Stan Long. Mr. T. told Stan that his 1990 corporate plan was a just too damn ugly, especially since Mr. T's boss, Gov. Rip Van Goldschmidt, has been snoring away, dreaming of re-election.

You see, not only did Stan want to throw 7,000 small employers out of SAIF's ranks (many of whom had been with SAIF for a long time), he also wanted to tell another 20,000 that it was some sort of crime that they weren't paying at least $1,000 annually in premiums.

Mr. T certainly didn't want to wake Gov. Rip and inform him that his quasi-public protector of workers' comp rights was going [illegible] to a bunch of small [illegible] so that large compan[illegible] could have subsidized workers' comp reductions.

And so, the drama unfolds . . .

Mr. T: Hello, is Stan Long there?

Stan: Hi Ted. I've just been out with my Workers' Comp Terrorists, and SWAT Team. I've been trying to get them to find something wrong in this system, to keep their jobs, you understand.

Mr. T: Well, God's speed and more power to them. Let's keep uncovering the fraud in the system. But Stan, I called to talk to you about your proposed 1990 corporate plan.

Stan: We started that three months ago and . . .

Mr. T: You were supposed to ask and wait for my permission.

Stan: We were? Hey, I never wanted this job, pal. Your Gov. Rip, er, Neil. He called me. Offered me a $110,000 annual salary if I'd come in here and clean up SAIF. And that's exactly what I'm doing. It's a thankless job, Ted. Although I have been getting some Christmas cards from large employers who just got our recent 20 percent premium discount. I even got a smoked turkey from one.

Mr. T: An appropriate gift Stan?

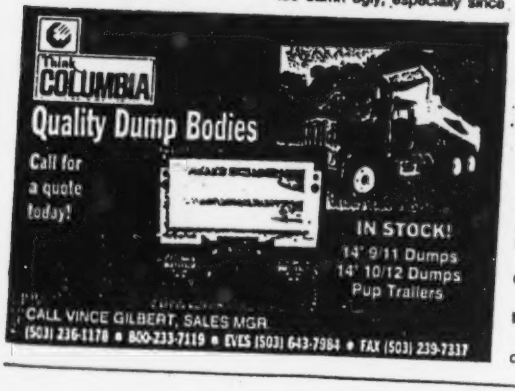
Stan: I think I miss your point, Ted.

Mr. T: My point is, you're giving 20 percent reductions to some of your larger clients while putting the screws to the small ones. There are some people out there who remember when SAIF was created to help small businesses in the first place. This just won't sit well with the public.

Stan: Tragic, isn't it Ted? A freak set of circumstances has forced us to drop 7,000 of the state's small businesses. Namely, we were getting $16 million in premiums from this group while paying out nearly $30 million in claims.

Mr. T: But don't you make over $100 million a year off of

See MR. T, Page 22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half of Rock Creek's students
n vocational-technical
ms, some of them unique,
ng the contract welding in-
on (far left) and the aviation
nics program (above).

PCC Rock Creek

A 'practical' education in practically everything

Washington County's only public college is the Rock Creek campus of Portland Community College.

Opened in 1976, the campus is on Springville Road east of 185th Avenue, about a mile north of the Sunset Highway.

Community colleges aren't like traditional four-year colleges. Their goal is to serve almost everyone, to open doors rather than impose strict entrance requirements.

It doesn't matter to a community college how old you are or how smart you are.

If you didn't graduate from high school, you can demonstrate that you could have by completing the Graduate Equivalency Degree (GED) program.

If you want to take college courses but feel the need to brush up long neglected learning skills, there's an an Adult Basic Education (ABE) program.

Some community college students are still in high school. They're getting a head start on college by taking classes for credit. Others are in their 60s.

At Rock Creek, where nearly 7,500 people have enrolled for at least one course, the average age is 30. Nearly half work fulltime in addition to going to school. Another 20 percent work part-time.

Half the students go to classes on campus. The others are scattered throughout the county. In many cases, they attend class at night in area elementary and secondary

It can send instructors to the workplace, where training occurs during working hours, or provide the training on campus.

One contract provided Rock Creek with an $85,000 welding machine. Instructors are teaching Pacific Northwest members of the Boilermakers Union how to use it.

True to stereotype, men are a majority among vocation-technical students, but PCC is trying to get more women into "non-traditional" occupations.

One effort is the Building Futures in Industries and Trades (BFIT) program, designed to get women into such occupations such as plumbing, welding and so forth.

In its most recent annual report, PCC

". . . we're affordable . . . we're close . . . Access is what community colleges are all about."

—Dean Betty Duvall,

The other half of Rock Creek's students plan to transfer to four-year colleges to complete work on a bachelor's degree and are enrolled in academic courses. At the biology learning center (above), they can get questions answered and use supplemental aids such as video and audio cassettes. The Building Futures in Industries and Trades program (below) aims at getting women trained for nontraditional occupations such as carpentry. At right, Dick Hollenbeck, landscape technology instructor, displays the blueprint for an Ecology Study Center. PCC plans to build on 90 acres surrounding its buildings.

Story by Doug Browning
Photos by Michal Thompson

exercise program.

Rock Creek's new executive dean is Dr. Betty Duvall. She arrived Dec. 1 from St. Louis (Mo.) Community College, where she was dean of instruction at the Florissant Valley campus.

She emphasizes Rock Creek's diversity, saying she wants to make sure people realize it's "a comprehensive college with a full range of programs and services."

She notes that about its "fulltime equivalent enrollment" is in traditional classes. "hat is, they're taking courses that will enable them to transfer to a four-year college for a bachelor's degree."

These academic programs are Rock Creek's fastest growing, with enrollment up 16.4 percent this term compared with last winter. What accounts for the growth, Duvall was asked?

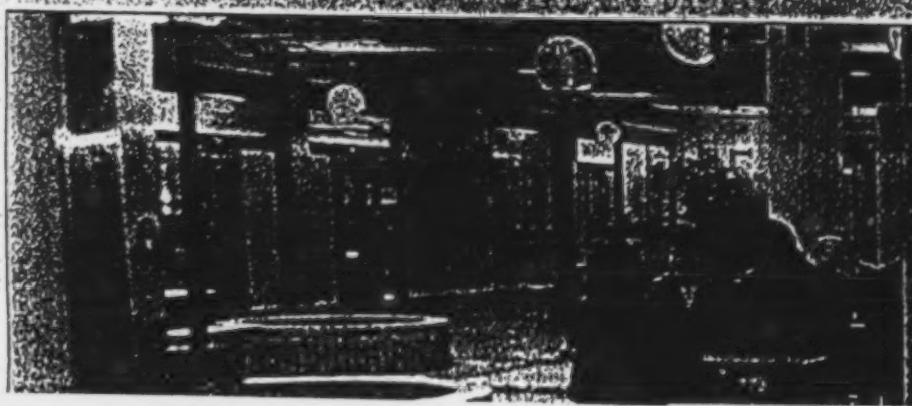
"Our surveys consistently show that students usually give two reasons. That we're affordable and that we're close to where they live. Access is what community colleges are all about."

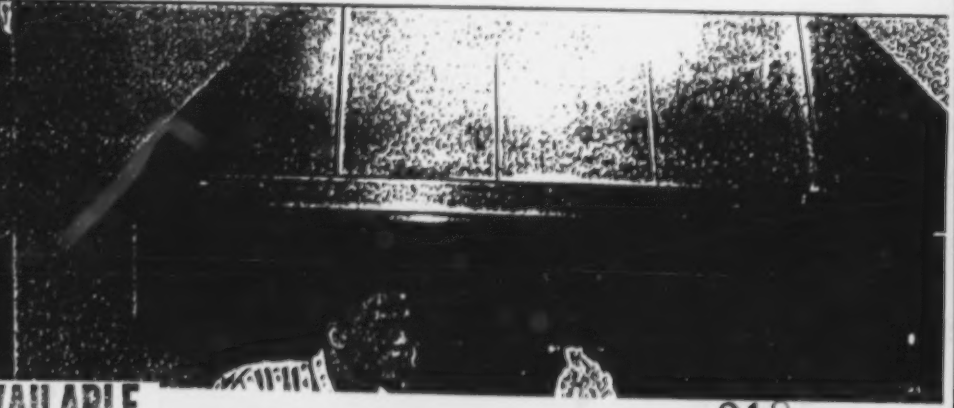
Rock Creek also offers a wide range of vocational and technical programs, including several not offered at other PCC campuses.

For example, it has a working farm for students training for agricultural work or to become veterinarian assistants. The entire campus is a living laboratory for landscape technology students. A hangar houses aviation technology courses.

Vocational-technical students tend to be a little older than the campus average, Duvall says: "These programs attract adults who've already tried some other occupation and are here to get new skills."

PCC also has contracts with business, industry and labor unions to train workers exclusively for them.





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RESOURCES HELP EASE LABOR CRUNCH

By John Kirkland

If you've got even a small measure of skill in the building trades, there's a job waiting for you in metropolitan Portland.

Such is the message of area builders and subcontractors who, while enjoying the fruits of the housing boom, are seeing the supply of labor in the area being stretched to its limits. Some are simply having a hard time finding workers.

But although workers can be hard to find in these times, labor resources are available that can provide builders with an alternative to the usual newspaper want ad. They include employment services aimed strictly at the building trades, and training programs that turn unskilled laborers into valuable craftsmen while they pair them with employers.

The services are needed more than ever before because

(Continued on page 7)

Instructor John Fulton demonstrates the use of a power nailer to the all-women Building Futures in Industries and Trades program at Portland Community College. It is the first program of its kind in the United States.

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Building Industry journal

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VOL. V, 3

MARCH 1990

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RESOURCES HELP EASE LABOR CRUNCH

(Continued from page 1)

of the level of building activity happening in and around Portland. Even in winter, a slow time for many builders, the labor crunch can be felt.

"In this industry, there's definitely a shortage of skilled labor," said Steve Shupe of Shupe Roofing, Inc.

Shupe, whose work involves primarily large apartment complexes on the Southwest side, said he is having more than the usual amount of difficulty finding skilled laborers, and is sometimes forced to take on people he wouldn't normally hire. "When we get desperate, I'll take unskilled people and try to train them," he said.

One resource for people like Shupe is the Building Construction Technology Program, a two-year course at Portland Community College's Rock Creek Campus that not only trains students in construction skills, but links them with area builders.

During the first year of the program, students spend most of their time in class with hands-on projects in concrete, framing and other construction basics.

In the second year, the students refine their skills while they work for actual builders, often spending their mornings on the job, and their afternoons on campus.

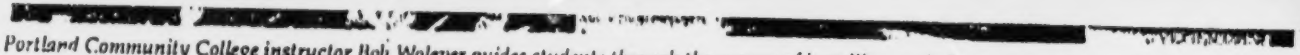
By the time students graduate, they have a wealth of salable skills, and they are well acquainted with employers in the area. These days, the demand for

Portland Community College instructor Bob Wolever guides students through the process of installing a window on a new house. Students are, from left, John Lafleur, Sean Conaway and Rick Craycraft.

By the time students graduate, they have a wealth of salable skills, and they are well acquainted with employers in the area. These days, the demand for graduates is overwhelming.

"We can't even come close to matching students up with what the people want out there," said Gaylon Huff, head of the program. "We've never had a year like this one; it's a rare day that I don't get a phone call."

Tom Kelly of Neil Kelly Company has been involved with the PCC program since it started, and has found it invaluable in selecting future employees.



Portland Community College instructor Bob Wolever guides students through the process of installing a window on a new house. Students are, from left, John Lafleur, Sean Conaway and Rick Craycraft.

A new program at PCC is Building Futures in Industries and Trades (BFIT), the first course of its kind in the country designed to bring women into the building trades.

The program started in July 1989 with funding from an 18-month federal grant, and involves six-month sessions of training in job skills, physical fitness and team work.

Classes are five days a week, seven hours a day. When it started, the program received 500 applications for 50 openings, demonstrating the strong need and desire among women to enter trades that heretofore were dominated by men.

Dan Saltzman, a PCC board member, said PCC, Associated General Contractors and the trades unions are working together to obtain jobs for up to 70 percent of the graduates. The same groups are looking for funding sources to make the program a permanent fixture.

The Willamette Carpenter Training Center in Northeast Portland takes a different approach by having its applicants find jobs first, and then enter the program to learn skills. The employees earn low money and receive few benefits when they start out, but make considerably more as they progress through the four-year program. Although the employees start out relatively unskilled, the program will train them for their employers' immediate needs, according to Garry Goodwin, a graduate of the program in 1956, and its director of carpentry instruction since 1986.

All wages are paid by the employers, and the program is funded through a trust fund of the Oregon Washington Carpenters Apprenticeship Training Program.

Another option for employers — one that just began in the last two years — is the Contractors Temporary Employment Service, which provides temporary labor for most construction tasks, from unskilled workers to skilled carpenters.

The firm was founded in 1988 by Nick Jacobsen, a concrete contractor who had trouble finding workers, according to account executive Duane DiCola. There were other temporary services available, but none geared toward construction or that didn't have tight restrictions on the amount of weight their employees could lift.

"Our temporaries either want to work in construction or have worked in construction; you have to have the mentality of 'I'm using my body for my job,'" DiCola said.

The company's temporaries work between 30 and 40 hours a week. Contractors Temporary Employment Service provides workers compensation coverage through Saif Corp., and offers a benefits package and vacation pay. It has its own safety program, and each of its workers are required to take and pass a drug screening program.

The company is able to provide such benefits because of the volume of temporaries it handles. During remodeling of the downtown Portland Nordstrom department store by a California construction company, Contractors Temporary Employment Service was able to provide 75 workers to the job at once, and at the same time fill the needs of smaller contractors.

"This is a competitive market, and the fact that the building industry is booming has a definite effect on our growth," DiCola said.

Companies in need of workers are encouraged to call any or all of these services: Building Construction Technology Program, Gaylon Huff, 244-6111; Building Futures in Industries and Trades, Gail Smith, 244-6111; Willamette Carpenter Training Center, Garry Goodwin, 287-3708; and Contractors Temporary Employment Service, Duane DiCola, 238-6856.

John Kirkland is the editor of the Building Industry Journal.

"We can't even come close to matching students up with what the people want out there," said Gaylon Huff, head of the program. "We've never had a year like this one; it's a rare day that I don't get a phone call."

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THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA
OREGON-COLUMBIA CHAPTER

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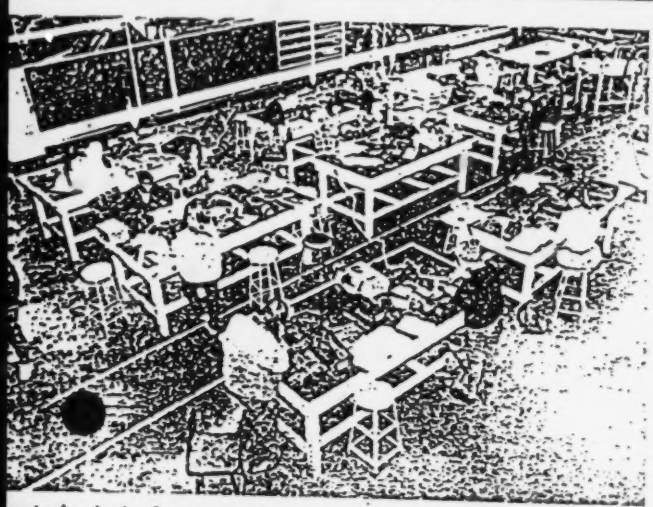
Associated General Contractors • 9450 SW Commerce Cir

Monday, March 19, 1990



ents in Judy Campagna's B-Fit electrical/mechanical skills s learn the concept of electricity and its industrial cations.

B-FIT II bringing more women into the trades

e '90s have been high- d as a "decade for diver- as the demographic shifts e nation's workforce bring and more women into the et.

ditional bastions of male oyment are seeing drama- anges as two-thirds of the entrants to the workforce women. The construction try has seen its own dra- changes in attempts to me, recruit and train wo- or careers in construction. Portland Community Col- - Rock Creek Campus, f the eering programs for this training is entering its second successful phase. B-FIT (the acronym for Building Futures in Industry and Trades) is a fast-tracked, total immersion training program designed to broaden interest in careers in the trades and prepare women for apprenticeship or entry-leve employment.

The first B-FIT group begar their training in late summer o last year.

The program screened ove 200 applicants for the first pilo group and of the 50-plu

See B-FIT, Page 2

B-FIT Continued from Page 17

Students help one another in B-Fit's electrical/mechanical skills course.

selected, over 40 completed the intense six-month course, graduating in December. The second group was screened and selected and began their training in mid-January.

Now, two-months into their training, "B-FIT II" is showing all of the promise of success of the first group.

"The two groups are comparable," says Chris Jones, employment coordinator. "The enthusiasm is something that runs through both groups. I think that, from a program perspective, we have all learned a lot from the first group. The tremendous success of the first group has really built the confidence level of the women in this second group. It's also built our confidence. We knew we had a good program, knew that what we were doing was absolutely right-on. And to see such a great success from the first group just reinforces that for us."

The enthusiasm and visibility of the program is something that has spilled over both in the trades community and the educational community.

CALENDAR

March 20
Eugene Area
Council Meeting
"Legal Aspects of

March 21
Public Relations
Committee Meeting
DeLap, White & Raish offices
1229 Lloyd 500 Building

The General Construction
Trade Exp

B-FIT: Job placement success exceeds goal

By AARON WARNER
Rock Creek Writer

ROCK CREEK -- More than 170 new applicants began the orientation and screening process this month for the B-FIT (Building Futures in Industry and Trade) pilot program.

Those selected will be the third group of women to receive skills training in non-traditional job fields through the Department of Education project.

The information from the demonstration project, funded by a $314,787 federal grant, is being used as a model for similar programs throughout the nation.

Recently, program director Gail Smith and Dr. Marjorie Carson, associate dean of business and industry, conducted a demonstration project and presented information about the program to technical educators from 38 states at the American Technical Educators Association conference in Oklahoma City.

So far, 75 organizations have contacted B-FIT for information and results of the program, according to Smith. The resulting statistics seem to indicate a success, she said.

From the first graduating class of 37, 33 were employed -- a 90 percent success rate, surpassing the target goal of 70 percent. The 90 percent success figure also is being predicted for the second group of 86 who will graduate soon.

It is significant that women are being trained for and entering non-traditional job fields, asserts Smith, because they are the hope for the future in a work force sadly lacking in skilled workers. Today, the average age of a skilled worker is 55, and these workers soon will be retiring. Color in the fact that the younger generation currently in training is the product of a baby bust, and the employment picture gets bleaker.

However, Smith says there is hope if one considers a previously untapped segment of the population -- women. Out of the 503 job fields open to men, there are only 19 being filled by women, she noted. By training women in these non-traditional job fields, a new source of wealth for skilled-trade employers is opened up.

The 90 percent success figure also is being predicted for the second group of 86 who will graduate soon.

Getting a job is the concluding step in the process begun with application and orientation. In the meantime, B-FIT recruits are prepared for the mental and physical challenges that work in a skilled trade demands. Smith says that, while many applicants have a clear occupational goal and may even have had some experience in the field, they often have gaps in their education.

The training conducted on the Rock Creek Campus is comprehensive and aimed at filling in these gaps. It includes life skills such as communication, problem solving, goal setting, job-search skills, workplace safety, construction math, and physical training.

Though it's a myth that we have to be superhuman" in order to partake of a skilled trade, says Smith, it is physical work that demands long hours.

This preparation culminates in actual practice at the Rock Creek Campus shop. Although the emphasis there is on electrical wiring, the recruits spend a week doing things such tasks as diesel work, car maintenance, sheet metal work, trouble-shooting small appliances, and engine work.

They also construct model homes -- pouring the foundation, measuring and cutting the wood, doing the sheet rock and roofing work, and even wiring the electrical sockets and lighting.

After completing the program, the women apply for jobs.

Their efforts are targeted at the 187 "apprenticeable" occupations in Oregon, according to jobs director Chris Jones. This is where the industry comes in, she says.

"They help with advisory and job placement, serving mainly as a liaison

(Please Turn to Page 7)

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B-FIT II launches 'Great 48' into work force

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Enthusiasm was the key vor[illegible]uring the graduation ceremonies of the second group of women to complete he innovative B-FIT program at Portland Community College - Rock Creek.

B-FIT (which stands for Building Futures in Industry & Trades) is an all-women trades training program designed to prepare women for a career in the construction industry.

With an expected two-thirds of the new workers during the next decade to be women, such programs are vital to the industry as it looks to new sources to meet growing labor needs.

The graduation of the second B-FIT group completes a one-year cycle which saw close to 100 women trained and graduated. This B-FIT II group, dubbed the "great 48" showed their spirit and the fresh perspective they will bring to the industry during graduation and recognition ceremonies held Thursday June 7 at the Rock Creek Campus.

Guest speaker Mary Wendy Roberts, Oregon's Commissioner for the Bureau of Labor &

See B-FIT, Page 21

Industries, warmed to the women's enthusiasm and encouraged them with her own message.

"I am proud of each and every one of you and your accomplishment," said Roberts. "Proud and encouraged by your dedication, your commitment and your enthusiasm. The trades need you, not just for your skills, but for these qualities you will bring with you."

Roberts spoke of the long tradition of women in the trades and how, for the first time in modern history, that role is changing.

"The first copy of the Constitution of the United States was produced from a press run by a woman," said Roberts. "The circular saw was invented by a woman. Throughout the history of this country, women have been called upon to step into the trades, particularly while men were at war, only to be expected to quietly return to their roles as wives and mothers when the men returned.

"Today, women's place in non-traditional careers and the trades is establishing a new and permanent tradition. You women are the pioneers."

The success of B-FIT has been phenomenal. The first group, which graduated last December, has a 90 percent rate of employment among its graduates.

Half of those employed are involved in an apprenticeship program.

Among the B-FIT II group, many have already found promised employment in the

gram, but there is the possibility that it will become a permanent fixture at the PCC-Rock Creek Campus.

"We're currently exploring the possibilities for funding which would allow B-FIT to continue indefinitely," says Gail Smith, B-FIT director. "I think we've been very successful with our training, as well as being very successful in getting the trades to notice what we're doing here. Between the two programs, we graduated nearly 100 women. We had easily three times that many interested in the program."

Part of B-FIT's unique approach has been a total training regimen focusing on strict physical conditioning training, career planning and personal development skills classes as well as introduction to electrical, carpentry and mechanical applications needed to enter the trades.

"This program is really the next logical step for women," says Chris Jones, program coordinator and job counselor. "There have been numerous 'women-in-transition' programs, but never the next step: taking work-ready and even work-experienced women and giving them career and networking skills. There has been nothing available to teach or encourage women how to network within this industry."

One of the final phases of the program was putting the learned skills to extended practical use.

While some women struck out on on-the-job trai[illegible] grams they researc[illegible]

B-FIT Continued from Page 21

Representative from the Boy Scouts were on hand to thank the women and present them with commemorative mugs for their work.

The women selected two spokeswomen from their group to offer comments and a perspective on their six-months.

"As important as any of the skills with tools and materials was what we learned about ourselves," said Carol Wright, one of the spokeswomen. "The knowledge that, yes, we can do this work, that pride in seeing the work of our own hands, that was wonderful. I hope that we will always stay in touch and I know that wherever we end up, this team of women will somehow always be supporting us. The challenges we face as tradeswomen will be many.

"What we have to remember is that we can't hope to go out there and immediately change the attitude that we can't cut it. If we are just ourselves, and successful as ourselves, we will change their attitudes. It will be inevitable."

AGC offers its hearty congratulations to the B-FIT Graduates from the Spring of 1990:

Christine Adams
Patty Allen
Karen Auel
Judith Cook
Sara Doughty
Brook Everett
Anne Galisky
Sherry Gillespie
Janice Glover
Shelly Harrison
Jody Hendrickson
Amy Hightower
Cassie Jo Curtis
Claudia Lee
Brandi Litke
Marley Mack
Sarah Maenza
Ann McFarlane
Sharon Menicosy
Kathy Miller
Suzanne Monk
Ingrid Nazarchyk
Angie Parcel
Sharon Parsons
Deaborah Phillips
Terry Potter
Teresa Pritchett
Chris Rachko
Vershell Rogers
Barbara Rowland
Catherine Schillinge
Carol Schmit
Carolyn Schneider
Katharine Settle
Rebecca Smith
Travern Snell
Nanette Stark
Jennice Taylor
Jill Tracy
Sheri VanLoo
Jeanette Wagner
Barbara Weathersby

Associated General Contractors Monday, June 18, 1990

Three happy members of the "great 48" group marking the second suc

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The Times

June 19, 1990

Opinion

From Rosie the Riveter to a New Generation of Skilled Women Workers

By Dan Saltzman
Trustee
Portland Community College, OR

Rosie the Riveter - the symbolic heroine of World War II - is about to return to the Portland, Oregon workforce.

In 1989, a partnership of labor unions, employers, social service agencies, and Portland Community College (PCC), OR, launched a federally-funded demonstration program to increase the number of women in high-paying skilled construction, mechanical, and electrical trades.

One year later, the program's second class of graduates is ready to enter the skilled trades marketplace and union apprenticeships.

The goal of the "Building Futures in Industry and Trades," or B-FIT program, is to provide a blueprint for other communities to follow to reverse the sharp decline of women in skilled trades and the lopsided concentration of women in lower-paying service and clerical jobs.

While World War II brought about a most profound increase in opportunities for women to train and work at skilled trade and industry jobs, it was also the high water mark. Over the past six years, in Oregon and the nation, the number of women applying for apprenticeship positions has been extremely small and rapidly declining. In 1990, only 4.4 percent of Oregon's apprentices were female, down from 5.9 percent in 1986.

We all have an interest in eliminating inequities associated with the concentration of women in low-paying occupations, with limited access to broader opportunities to provide adequate child care, and with the earnings gap, women place shockingly lower in wage level than men — averaging 44 cents for each dollar earned by men in 1984. Yet the number of families maintained by women is growing rapidly and increased almost 90 percent between 1970 and 1985. This phenomena led one national advisory commission to the dire prediction that female-headed families would comprise 100 percent of the poverty population by the year 2000.

This prediction will not come true if we have a robust economy and the commitment to provide specialized training and assistance for women to enter and succeed in the trades.

Essay

The economy is doing its part. The US Department of Labor predicts that carpenters and electricians are in the top 30 occupations that will have the largest projected job growth through 1995. The Labor Department's Workforce 2000 study notes that the aging workforce and the declining birth rate will produce a shortage of workers unless those groups who have been traditionally underutilized enter the workforce.

Clearly there will be jobs for women in high-paying, male-dominated trades. Just as clear, however, is that they will be unable to take advantage of the opportunities without appropriate training. That is where the B-FIT program comes in.

Two reasons Portland was selected for federal funding are the substantial in-kind contribution of teachers and equipment provided by PCC and the commitment of unions and employers to guarantee that at least 70 percent of that cooperation among the private sector, public agencies, and a community college can overcome obstacles women face in work in the trades; recruit, train and place women in skilled trade and apprenticeship positions; and enable them to succeed.

The B-FIT demonstration program is unique in its approach and scope. The 18-month demonstration program funded two five-month sessions at PCC for 50 women each. The sessions are seven hours a day, five days a week.

Unlike similar programs, B-FIT targets a broad spectrum of women, not just those from low-income households. Each applicant receives a personal interview and a skills assessment prior to admission. Those not admitted are referred to advisors at PCC for guidance into other non-traditional or traditional, higher-paying career programs.

For many women, working in the skilled trades means a lifestyle change. That is why B-FIT's comprehensive approach goes beyond the teaching of basic trade skills.

It includes building basic reading and math skills; tutoring to meet entry-level apprenticeship program qualifications; physical strength-building; computer and hazardous materials training; hands-on work site experience in the accomplishment of a charitable project; preparation for job interviews; and a support group of women working in trades to provide job networking; problem-solving and support.

Dan Saltzman

completion. Over 90 percent of the first class of graduates are employed. Jobs are waiting for the second class of 48 women finishing the B-FIT program this month.

Over 500 applicants for the first class of 100 is a strong sign that many women are ready for the challenge and the opportunity that B-FIT embodies. Portland Community College is committed to continuing B-FIT beyond the federally-funded period as long as appropriate to meet the needs of both women and industry.

We are optimistic that the first graduates of B-FIT are but the first wave assault, securing higher-paying jobs and fighting poverty with the same dedication Rosie the Riveter brought to winning the war.

Dan Saltzman is president of Environmental Management Solutions of Portland, OR, in ad-

B-FIT 'delivers' the jobs

About one in four unable to hold onto work for variety of reasons

By AARON WARNER
Rock Creek Editor

Is B-FIT building futures in industry and trade?

The program that has been successful in placing 86 percent of its first two groups of graduates has reportedly been hurt by the recession and job attrition, although approximately three out of four graduates are still employed today.

Chris Jones, B-FIT's employment coordinator, recognizes that all of the program's students may not have a firm grasp of the program's true purpose.

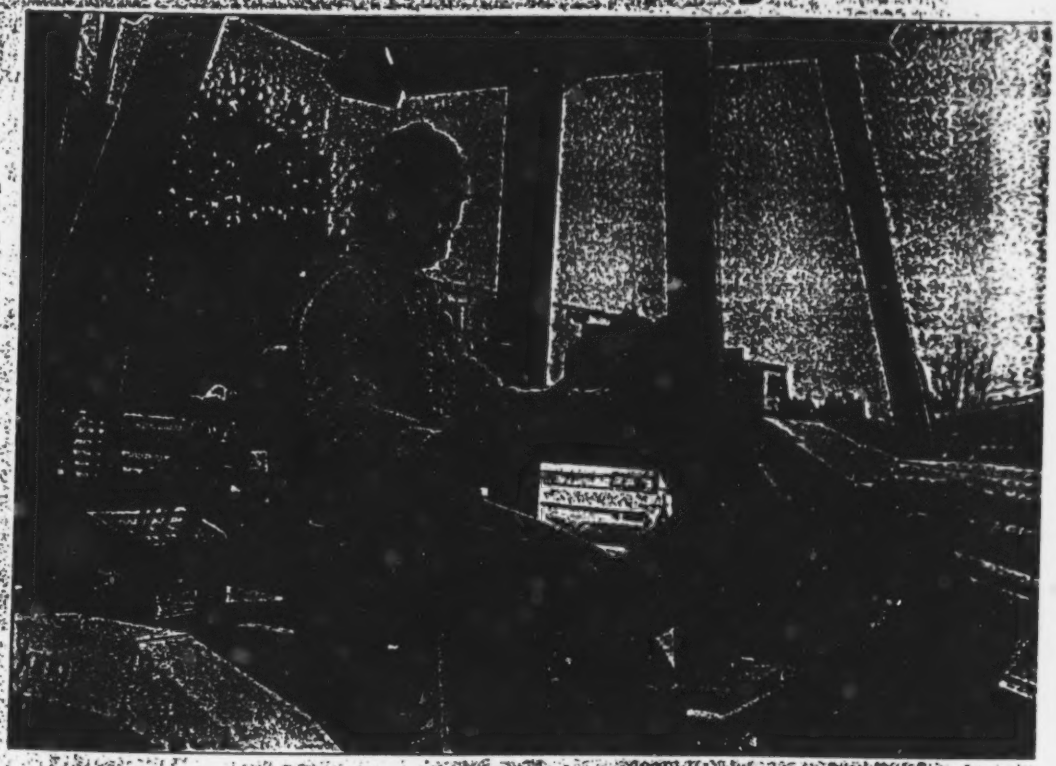
"To the students who complain 'I wasn't placed where I wanted to be,' we can't do that in six months," Jones said. (Six months is the duration of the training program.)

Jones explained that, besides the short duration of the program, it is hard for training to pinpoint skills to any one apprenticeable occupation. There are 187 apprenticeships in the state of Oregon, ranging from appliance repairer to parts worker to web pressman. What B-FIT does do, she says, is to give students the basic skills necessary to land an entry-level job in the trades.

"We've delivered what we promised," Jones maintains.

Program Director Gail Smith added that what is promised and delivered is a "foot in the door" for women and minorities to get into the skilled trades. "Our whole focus is for graduates to go on to other training," through apprenticeships and other forms of preparation.

One woman taking full advantage of B-FIT's opportunities is Debbie Umscheid, who is employed by Copenhagen Utility and Construction. She is learning on the job, and the skills she learns on the job will be put towards an apprenticeship in heavy equipment.



The Bridge/ Dan Morrison

Debbie Umscheid, a B-FIT graduate, operates a forklift for Copenhagen Utility and Construction.

Skilled tradeswomen like Umscheid are in demand with employers, says the B-FIT staff. In fact, statistics show a shortage of skilled tradeswomen through the year 2000. Do the entry-level skills taught by B-FIT make a difference?

"You bet," says Audrey Castile, president of S & L Construction, who has program graduates employed at her company.

B-FIT graduates, Castile noted, have a clear idea of what will be expected of them in the workforce through their training. "[The training] definitely helps the employer," she said.

As for B-FIT employees who do not hold down their jobs, Castile says, "There were some who had a lack of understanding of what was involved in the work, an underestimation of the physical strength involved, or just a lack of commitment to this kind of work."

Smith noted that she could spot lack of understanding and commitment before employment. "The ones that were the most difficult to work with in the program, the ones that were hardest to work with and place, were the ones who didn't work out."

Chris Jones says, "There have been disappointments for me, too – employer-employee relationships that didn't work out, but that's reality."

Still, for Jones, every cloud of disappointment has its silver lining. "Listening to everyone," she says, "and being sure their voice are heard is a challenge I enjoy. Talking to graduates and listening to their feedback helps me to do better."

Sylvania plans M

SYLVANIA-The Sylvan ASPCC is sponsoring a series forums entitled "War in the Mid East."

Dr. Mel Gurtov, a PS instructor who specializes in U. foreign policy, will speaking and at noon in the Cedar Room. At p.m. in the Pine Room, Pro

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Labor Department Announces Winners Of Its Work-Force Quality Competition

By Cathy Trost
Staff Reporter of The Wall Street Journal

WASHINGTON — While many companies are bemoaning the flagging quality of the work force, others are winning Labor Department awards for their solutions to the problem.

On Wednesday, the agency offered up the winners of its first work-force quality awards. Not surprisingly, one of the common threads is training.

The awards—called LIFT America (an acronym of Labor Investing for Tomorrow)—are given to employers, unions, educational organizations and communities to recognize "creative solutions" for upgrading the quality of the work force. Sixteen winners were chosen from 500 nominees; they run the gamut from local vocational programs to industrial giants.

Vermont Heating & Ventilating Co. was cited for its embrace of programs to enhance skills and motivate workers. John Stearns, head of personnel training, says the 250-employee company in Colchester, Vt., spends 10% of gross revenue on training and education programs. Elaine Druke, who rose from a journeyman sheet-metal worker to vice president, administration, credits much of her success to the company's motivational efforts. "Without the educational help," she says, "it wouldn't have happened."

International Business Machines Corp. was honored for its employee "work/life" programs. The IBM programs, addressing family-related needs, include assisting employees with child care and elder care, spouse relocation, schedule flexibility and leaves of absence, and a broad array of seminars, educational and career assistance for retirees. The company also has committed $25 million to increase the supply and quality of child-care and elder-care services in areas where employees work and live.

Though the IBM programs involve both women and men, they partly reflect IBM projections that over the 35-year period ending in 2000 its male employee population will have dropped by 25% while the number of its women employees will have tripled.

Several other award winners also stress efforts to improve opportunities for women and minorities. Building Futures in Industry and Trades, a program run by Portland Community College in Oregon, is a "fast track" six-month training course designed to put women on paths for such nontraditional skilled careers as electricians, plumbers, carpenters and sheet-metal workers in jobs that pay $15 to $25 an hour.

Previously, women weren't striving toward such jobs, program officials say. Many of the women students, whose average age is 36, were working in low-paid jobs—such as in fast-food restaurants—when they entered the program. About 35% were unemployed and on welfare; 70% were single heads of household.

The program fills women's "skill gaps" through immersion courses in everything from learning how to wire electrical projects to a physical-fitness program to career planning. The women build a house from the foundation up, do upper-body training, and even hear from sex-discrimination attorneys on how to file a complaint if a problem arises. Since the summer of 1989, when the program started, 106 women have completed training—an 87% graduation rate. Of the graduates, 90% went on to apprenticeship or on-the-job-training positions.

Katharine Settle says she entered the program because "my husband had just recently left after 34 years of marriage, and I found myself thinking about what I was going to do for a living." Though she hadn't had a job in 26 years, she thought the training program would help her acquire skills to be a residential-construction contractor and thus make use of experience already gained while helping to build and renovate houses with her former husband. She's now pursuing an associate degree in building-construction technology and says the training program was "invaluable" in helping her reach her goals.

The Labor Department also selected a program created by the National Urban Coalition and funded by Shell Oil Co., part of the Royal Dutch/Shell Group, to better equip minority and women students with math, science and technology skills. The program, begun in 1987 at nine elementary schools in Houston and Washington, D.C., has expanded to 30 schools around the country. Specially trained teachers use new techniques to teach skills, and students are also required to spend Saturday mornings at school or on field trips with a parent or family member for family learning sessions. The teachers link science skills to the children's own heritage, and use special role models to motivate students, including minority astronauts, entertainers and athletes. Follow-ups show the program made positive differences in test scores, attendance and motivation levels of participating children.

"Most companies are beginning to realize the changing demographics of the work force and the fact that the schools are in a crisis," says Paula Saizan, Shell's coordinator for the program, which is called "Say YES to a Youngster's Future."

Chevron's Spanish Properties

SAN FRANCISCO—Chevron Corp. put its oil and gas properties in Spain back on the market after withdrawing them last year for lack of any "appropriate bids."

The properties include an 18.92% interest in the Casablanca offshore oil field, 25% interests in a smaller onshore oil field and in an onshore gas complex, and various exploration permits.

The oil company said net proved reserves of its interests in the three fields are estimated at the equivalent of about six million barrels, of which about 80% is crude oil and the rest is natural gas.

Wall Street Journal, Friday, September 21, 1990

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John Fulton, a PCC Rock Creek instructor, teaches women in a building trades program proper use of an electric saw as program director Gail Smith (far right) listens.

The Oregonian/ROBERT BACH

Construction training for women wins merit award

By STEVE KADEL
Correspondent, The Oregonian

ROCK CREEK — A program that trains women for careers in the building trades has won an award for excellence from the U.S. Department of Labor.

Building Futures in Industry and Trades, a six-month program offered through the Rock Creek campus of Portland Community College, was one of 16 honored nationwide from among 520 nominees for the LIFT America Awards.

Ninety percent of the 87 women who complet[illegible] the course last year now are e[illegible]oyed in building trades, with an average starting wage of $9 per hour. Many of those women took a day off work Friday to attend a news conference at PCC Rock Creek at which the award was announced.

"The enthusiasm, determination and skills these women have are tremendous," said Mary Wendy Roberts, Oregon Commissioner of Labor, whose office nominated the PCC program. "This is one of the best programs I've ever seen to improve the work force."

The year-old program is a partnership among PCC, the Oregon Bureau of Labor and Industries apprenticeship programs, private industry, trade unions and Oregon's Adult and Family Services Division.

During their training, students build a house after learning construction, mechanical and electrical skills. They also study sex discrimination laws, learn about working near hazardous materials, complete math and reading instruction, and undergo strength training.

The program also exposes students to related work in welding, aviation mechanics, auto body repair and diesel mechanics.

PCC's program was one of only four winners nationwide in the business-s[illegible]l category. Gail Smith, direc[illegible]f the program, and Marjorie Carson, associate dean of business and industry at PCC Rock Creek, recently attended an awards ceremony in Washington, D.C., during which the winning programs were honored.

"Our original goal was to make the students adequate, but we found instead they became exceptional," said Smith, who worked in the construction industry for 16 years.

Students not only learn basic skills, she said, but also develop work habits, such as punctuality and the proper attitude required for successful careers. Students' high motivation is evidenced by the fact that 87 of 100 students admitted last year completed the program.

Fifty-five women enrolled thi fall, with a waiting list of 27 women seeking admission in th future, PCC officials said.

Donna Boyd, 52, of Portland i among those entering their secon week of the program this fall. Sh seeks a career in constructio trades "because I want to be a example to my children and gran children."

Boyd said she had held sever jobs in the past, ranging fro office-related positions to driving taxi.

"Now I want to change and d something [illegible]ally enjoy," she sai "I love working outdoors and want something I can gro[illegible]"

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Monday, Oct. 8, 1990 Daily Journal of Commerce

B-FIT given national award

The U.S. Department of Labor recently awarded six programs for their innovation in training the future workforce. The LIFT award, "Labor Investing For Tomorrow," (held at far right by B-FIT Director Gail [illegible]th) honors B-FIT's success placing 100 women into the trades last year. Below, John Fulton, B-FIT instructor, demonstrates for the new group of B-FIT recruits. B-FIT is now part of the standard curriculum at Portland Community College and has an applicant list of more than 200 interested women.

PCC program gets 'LIFT' from award

By KEVIN HARDEN

Portland Community College's B-FIT program celebrated its "women power" last week with an award from the U.S. Department of Labor.

About three dozen graduates and participants in the construction industry training program joined PCC and state officials Friday morning at the Rock Creek campus to celebrate the LIFT — Labor Investing For Tomorrow — America award presented in mid-September by U.S. Labor Secretary Elizabeth Dole.

"This program is about all the issues that the industry is focusing on right now," said Gail [illegible] B-FIT program director.

B-FIT — Building Futures in Industry and Trades — is a year-old program that provides a six-month training program at PCC's Rock Creek campus for women interested in pursuing careers in most construction trades. Included in the training is electrical/mechanical skills, mathematics, computer skills, physical fitness and jobsite experience.

Women in the program build a house and work on other construction projects. Nearly 90 percent of the program's graduates have jobs in the construction industry, most starting at $9 or better an hour for entry-level wages.

B-FIT was one of 16 programs across the nation to receive the LIFT America awards from Dole. More than 520 programs were nominated for the national honor. PCC's program was one of only four in the educational category that received the award.

Fifteen representatives from the construction industry, labor unions, social service agencies and state organizations work with the college on an advisory committee to guide the program.

Most of the praise for the program came from college and state officials who said it was a good start to breaking down barriers to "non-traditional" roles for women in the work force.

"I feel that one of the best ways to improve the work force is to open the doors of opportunity for women and minorities through apprenticeship," said state Labor Commissioner Mary Wendy Roberts. "Many of the women in the B-FIT program have either become apprentices or declared an interest in a specific apprenticeship program.

"For the '90s and beyond, we need a work force that is equipped to learn, prepared for change, prepared to apply new technology — competent, skilled, motivated, fulfilled, valued and committed to the highest standards of work excellence," she said.

B-FIT began more than a year ago as a $312,000, 18-month U.S. Department of Education demonstration project. PCC contributed an additional $100,000 in in-kind services and the college will absorb the program's entire budget beginning next year.

Funding for the program could be in jeo-

See PCC, Page 32

PCC program helps women start careers

B-FIT has placed in jobs 90 percent of its graduates

By SUSAN HEREFORD
Correspondent, The Oregonian

ROCK CREEK — A single mother of four children, Jennice Taylor is entering the building trades through a special program that gives women a leg up in electrical and building construction careers.

"I wanted something nobody could ever take away from me," said Taylor, who recently got a job as an electrician's apprentice. "I could get that in the trades."

Taylor, who lives in Hillsboro, is one of 48 women who recently graduated from the second class of the 1-year-old B-FIT — Building Futures in Industry and Trades — program.

The program is a cooperative venture between Portland Community College, Oregon's Bureau of Labor and Industry apprenticeship programs and Adult and Family Services, trade unions and private industry. Located on PCC's Rock Creek Campus, B-FIT has had a 90 percent placement rate for the 85 women who have completed the program.

Upon her graduation in June, Taylor was accepted into an electrical apprenticeship and is now working for Marine and Industrial Electric, a Portland electrical contracting company. Her starting wage was $14.10 an hour.

It will take her four years to earn a journeyman's license from the state, but in the meantime Taylor will earn regular pay increases while receiving on-the-job training and attending night classes.

[redacted] Rahberger, director of apprenticeship and training for the state Bureau of Labor and Industry, was with the 48 B-FIT

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fort they had built in Southeast Portland.

"This is the work force," he said. "You're seeing it right here. If we don't develop it, nurture it and transition it, we will be doing ourselves a tremendous disservice."

Work force to change

By the year 2000, the work force Rahberger refers to is expected to be markedly different from the one now.

According to demographic studies, the typical American worker entering the labor force will be female, minority, immigrant and older.

Rahberger said the B-FIT partnership developed in Oregon was a pioneering trades program for the country.

"To the best of my knowledge, this is the best program of its kind in the nation," he said. "The model they have developed can work not only for women, but for ... immigrant and minority populations as well."

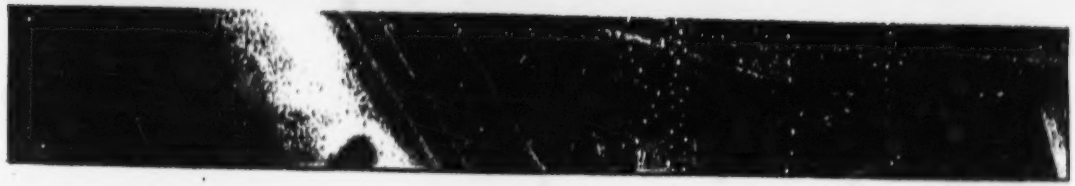
The key to success lies in the intensive, short-term program designed by the college and its partners.

Gail Smith, B-FIT director, calls it "learning by total immersion. They're here seven hours a day, five days a week for six months. This is a much faster pace than the traditional college schedule. Our goal is to get them ready for other training."

B-FIT gives the women 230 hours of instruction in construction and mechanical/electrical basic skills. They concentrate on trades, math, blueprint reading, safety, hand and power tool use, materials, basic electricity, trouble-shooting, mechanical devices and repair and maintenance.

They also put in four hours a week working out in the Rock Creek gym for overall body conditioning and upper body strength.

Other program areas include classes on communication, problem solving, goal setting and job search skills; cardiopulmonary resuscitation and first aid; microcoputer instruction; and work-site training.



SUSAN HEREFORD

Jennice Taylor (left) of Hillsboro and Vi Bryant of Portland work on construction of the Scouter's Mountain Boy Scout fort in Southeast Portland. Both women have been accepted into apprenticeship trade programs after completing the B-FIT program at Portland Community College.

SUSAN HEREFORD

B-FIT program members break for lunch during construction of the Boy Scout fort in Southeast Portland.

According to Smith, the first year of operations far exceeded their expectations. The target goal was to graduate 60 percent of the class and find jobs for 70 percent of the trainees. While the graduate percentage was slightly higher, the number of women finding jobs following the program completion reached 90 percent.

The response to the program has been overwhelming. B-FIT has a waiting list of 215 women, culled from the 600 women who have attended orientation and information sessions.

"Even more stunning is that entry-level wages are much higher than we expected," Smith said. "Many of the women are entering the work force with $11 to $14 an hour wages. Our expectation was $7 to $8. The pre-program median wage averaged $5.40 an hour."

The B-FIT graduation was Taylor's first. "It's important to me because I'd never had one," she said. "I've wanted to go to school for 16 years and now it's my turn.

"My B-FIT graduation is an incentive for my two teen-age sons to follow through. They see Mom out there roughin' it. They've seen another side of me."

THE OREGONIAN, THURSDAY, AUGUST 30, 1990

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National Notes (continued from page 9)

Dole Leaves Labor Post

Labor Secretary Elizabeth Dole resigned last month to take over as president of the American Red Cross.

A vocal supporter of community, technical, and junior colleges as an key factor in strengthening the nation's economy, Dole was the highest ranking woman in the Bush administration.

Outgoing Labor Secretary Elizabeth Dole was a Champion of community, technical, and junior colleges. Dole, right, recently presented a "Lift America" award to Portland Community College's, OR, "Building Futures in Industry and Trades Program," citing the college's partnership with local employers to help prepare women in the trades. With Dole is Gail Smith, director of the program.

Congress Starts Tech-Prep

Continued from page 1

formed, or are building, "two plus two" consortia with their nearby high schools should put their state vocational education agency on notice that they expect to be considered for this year's Tech Prep funding. (In other words, don't sit by waiting to be invited into the program.)

As the accompanying table shows, TRIO and the Supplemental Educational Opportunity Grants also reaped large "peace dividends." TRIO was increased by $92 million, and SEOG by $61 million over last year's levels.

The Strengthening Institutions program (Part A) received the largest Title III increase, almost $5 million.

The Fund for Improvement of Postsecondary Education (FIPSE), which has been able to show Congress a high success rate for projects it funds, was increased 25 percent, to $14.6 million.

And funding is continued for two other community college interests—the Veterans Education Outreach Program (VEOP) and the Cooperative Education program—despite White House requests to "zero them out."

Thanks largely to Tech-Prep, total funding for vocational education (Perkins Act) exceeds $1 billion for the first time. At $1,003,792,000 for FY'91, it is $74 million over last year's level. The total includes $33 million for consumer/homemaking education, as well as the $63.4 million for Tech Prep.

Funds for the Adult Education Act were increased some 40 percent, with support for state programs boosted from $158 million to $201 million.

The $565 million increase for Pell Grants, while pegging the maximum grant at $2,400, includes $365 million to cover shortfalls from prior years.

FY'91 EDUCATION AND TRAINING FUNDS
HIGHER EDUCATION ACT

	FY'90 Final	Admin. Request	Conference Agreement
I. Student Aid			
Pell Grants (IV-A1)	4.805	B5.277B*	5.370B**
SEOG (IV-A2)	459M	459M	520 M
CWS (IV-C)	602M	602M	595 M
Perkins Loans (Cap. Contr.)(IV-E)	135M	0	156 M
Income Contingent Project (IV-D)	9.9M	15M	4.9M
SSIG (IV-A3)	59.M	0	63.5M
GSL (IV-B)	3.826B	3.368B	5.540B
TRIO (IV-A4)	242 M	270M	333.7M
II. Categorical Programs			
Student Literacy Corps (I-D)	5 M	5 M	5.4M
Library Training	.9 M	.9 M	1 M
Research Libraries (II-C)	5.7M	5.7M	5.9M
Library Technology (II-D)	3.7M	3.7M	3.9M
Strengthening Institutions (III-A)	82.9M	86.6M	87.8M
HBCU's (III-B)	95.4M	95.4M	99.5M
Challenge and Endowment Grants (III-C)	17.9M	33 M	17.5M
Veterans Education Outreach (IV-A7)	2.8M	0	2.7M
School/College Partnerships (V-B)	3 M	3 M	3.9M
International Studies (VI)	34.7M	34.7	40 M
Fulbright-Hays Act	5.1M	5.1M	5.9M
Facilities borrowing authority (VII-C)	30 M	5 M	30 M
Interest Subsidy Grants, prior yr. (VII-D)	22.4M	20.9M	20.4M
Cooperative Education (VIII)	13.4M	0	13.2M
FIPSE (X-A)			

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B-FIT STUDENT STATUS REPORT
MARCH 28, 1991

The following is a summary of the four B-FIT sessions beginning Summer 1989, through Spring term 1991.

ENROLLMENT/EMPLOYMENT STATISTICS	CLASS #1	CLASS #2	CLASS #3	CLASS #4	TOTAL
Students Started	52	54	51	35	192
Students Graduated	37	48	44		
Graduate Percentage	72%	88%	86%		
Employment Goal (% of Grads)	70%	70%	70%		82%
Actual Employment Percentage	81%	91% (Not available for 60 days after graduation)			70%
	(30 of 37)	(43 of 48)			

PERSONAL STATISTICS FOR CLASS 1-4

Number of Children	218
Single Head-Of-Household	77%
Assisted By Welfare	33%
Minorities	17%
Federal Financial Aid, and/or Scholarship Assistance Through PCC Foundation	41%

Note:
520 are on our active contact list.
35 have been pre-approved for Fall 1991 enrollment.
Pre-program wage average: $6.88/hr. Wage after graduation: $8.48/hr in training programs with earning potential of $13.00 to #21.00/hr.

NAME	PRE-PROGRAM OCCUPATION	WAGE	PLACEMENT	WAGE	CURRENT STATUS
ADAMS	Unemployed		Unemployed		Health, family
ADAMSON	Light Industrial	5.05	Laborer	7.00	Quit 12/28; unable to reach
ALLEN	Administrator	19.32	Carpenter Appren	8.00	
AUEL	Unemployed		Not Available		Available 10/90
AUST	Real Estate Comm		Drop 7/31/89		Drop 7/31/89
BAKER	Clerical	6.25	(1)Flagger,(2)Landscaping	14.00	Lay off, documented attendance problems 6/90
BANTILAN	LPN	8.50	Naval Reseve	8.50	Availabe 9/90
BARKER	Caregiver	4.00	Patient Care	4.00	Did Not Complete OJT, 7/90 Mechanics course in CALIF
BATTILEGA	Family Business	5.00	Self Employed	10.00	Bids contracts for counter tops Lloyd Willams Corp
BAUMAN	Machine Operator	9.35	Drop 1/11/90		
BEVERIDGE	Temporary	4.50	Did not complete		Did not complet OJT, no contact, no response to LMTC
BRADBURY	Dryfold	6.95	Electrical Appren	9.00	
BRYANT	AFS		Maternity		Accepted Taper's Appren, pregnancy
BRYANT	Slavage	7.00	Finished second tern		Back injury first term, completed second term
BURCHELL	Janitorial	4.50	Asbestos Abatement	9.40	Abatement Certificate, employed 4/25/90
CASE	Custodian	4.62	Laborer	6.50	Laid off after one week, back to janitorial
CERVERRA	Deck Hand	10.00	Deck Hand Samoa 12/14	12.00	Returned fr trip 5/28/90, Deck hand coast 6/18/90
CHAMBERLIN	Postal Casual	5.50	Nurses Aid	4.75	Did not complete OJT
COOK	Unemployed	0.00	Home Repair	7.50	
COREY	Assembly	7.74	Carpenter Apprentice	8.00	Moved, Eugene, ODOT OJT- Hwy work
DAVIDSON	Clerical	5.00	Electrical Appren NU	11.00	Wage approximate, Davis-Bacon/Other
DIEHL (GREEN)	Clerical	6.00	Unconfirmed		Married 1/90, unable to contact re status
DOUGHTY	Temporary	5.00	Painting PT	6.50	Interviewing
DUFFY	Maintenance	7.00	Millwright	13.52	Early placement 10/1/89
DUNBAR	Food Service	4.25	Unemployed		2/20/90 Daughter very ill
EVERETT	Ofc. Mgr.	5.25	Relocate/Eugene		Carpenter Appren/Eugene
GALISKY	Self-Employed	7.50	Woodworking PT	7.50	
GILLLESPIE	Sht Metal Shp	5.50	Edge Concrete	6.50	Terminated one week; Interviewing
GIROUX	Real Estate Comm		Drop 8/4/89		
GITOME	Janitorial	8.75	Drop 10/2/89		Health
GLOVER	Waitress	3.35	Longshoreperson	15.00	
GRAVELLE	Baker	6.50	Drop 9/22/89		No contact
GRAY	Food Service	6.50	Laborer	8.00	Dropped due to finances, place by AGC in construction
HARNER	Waitress	3.35	Laborer	9.00	
HARRISON	Clerical	8.25	Not Available		Maternity Leave
HASS	Clerical	6.00	Drop 2/8/90		

NAME	PRE-PROGRAM OCCUPATION	WAGE	PLACEMENT	WAGE	CURRENT STATUS
HENDRICKSON	Unemployed		Property Mgmt	7.50	METRO Appren/Waiting Dispatch
HIGHTOWER	AFS		Auto Mech Scholarship	5.00	PCC Auto Mechanics Work/Study
HODGES	Clerk	4.25	Laborer	7.00	
HOUGH	Clerical	7.25	Electrical Appren NU	16.10	
JOHNSON	Clerical	7.00	Banking Clerk	7.50	Tapers Appren 6/90; working old job until dispatch
JONES	Photographer	5.00	Drop 4/18/90		
KEADY	Driver	5.67	Drop 9/25/89		
KEARNEY	Clerical	8.00	Electrical Appren NU	6.50	
KERRON	Janitorial	4.40	Drop 8/18/89		
LEE	Unemployed		Waiting Dispatch	9.00	Electrical Apprentice NU
LITKE	Unemployed		Siding Installer	7.00	
MACK	Volunteer		Flagging	8.00	
MAENZA	Clerk	5.75	Waiting Dispatch	8.00	Carpenter Apprentice NU
MC DONALD	Janitorial	6.50	Drop 8/17/89		
MCFARLANE	Food Service	3.75	Food Service	4.25	No transportation, no license
MCWILLIAMS	Bartender	6.00	DropDrop 1/18/90		
MENICOSY	Bookkeeper	5.00	Bindery Technician	6.00	PT Countertop installer trainee
MILLER	Clerk	5.75	Const. Millwright	9.50	
MONK	Checker	11.05	Waiting Dispatch/checker	11.05	
NAZARCHZK	Food Service	3.75	Waiting Dispatch		Carpenter Apprentice NU
OWEN	Woodworker	5.25	Electrical Apprentice NU	11.50	
OWENS	Landscape	4.50	Drop 8/18/89		
PARCEL	Visiting Nurse	4.94	Laborer	14.00	
PARKS	Ans. Serv. Oper.	5.00	Appren Interior/Exterior	7.45	Dropped apprenticeship after first week
PARSONS	Parts Clerk	7.00	Waiting Dispatch	7.50	Not Available, 9/1/90
PATTERSON	Tax Preparer	12.00	Laborer 3/89	9.00	
PATTON	Clerk	6.50	Clerk	7.00	Returned to former work w/benefits, 3 children
PETERSON,C.	Clerical	4.75	Drop 8/22/89		
PETERSON,S.	JTPA	5.46	Drop 10/30/89		Health
POST	Houskeeper	3.75	Apprentice Carpenter U	7.25	
POSTON	Food Handler	1.00	Drop 11/1/89		
POTTER	Warehouse	6.00	Laborer	6.50	Terminated - 1 week
PRITCHETT	AFS		Welding Trainee	6.50	Terminated, too slow; interviewing
RACHKO	Production	6.25	Interviewing	7.50	HVAC/Alexsis Hotel Mainenance
REIGLE	Medical Aide	6.72	Medical Aide	6.72	Carpenter Apprenticeship U; unable to find work
RICH	Waitress	4.00	Drop 8/31/89		Family
ROGERS	Unemployed		Siding Installation	7.00	

NAME	PRE-PROGRAM OCCUPATION	WAGE	PLACEMENT	WAGE	CURRENT STATUS
ROWLAND	Collections	5.00	Electrical Appren	7.25	Union Electrical
SANDER	Lifeguard	B	Drop 3/14/90		
SAYLES	Temp Clerical	6.00	Self-Employed	UK	Neil Kelly intern, no hire
SCHEER	Caretaker	5.00	Operating Engineer Appren	14.00	
SCHEFFER	Mailroom	6.23	Drop 1/18/90		
SCHILLINGER	Hygienist	17.50	Hygienist	17.50	Accepted Plumber Apprenticeship U
SCHMIDT	Maintenance PT	10.00	Waiting Dispatch	7.00	Electrical Appren U
SCHNEIDER	Self Employed		Electrical Apprentice	7.00	Electrical Appren NU
SETTLE	Student	6.50	Self Employed/PT PCC	6.50	
SHOREY	Elect Installer		Electrical Apprentice NU	11.00	
SMITH	Janitorial	4.00	Manufacturing	7.50	
SNELL	Bookkeeper	4.50	Laborer	7.00	
SOLOMON	Trainee	3.35	Detailing Trainee	5.75	(1)Webb Auto Body, (2)Speeds Towing w/ upgrade
STARK	Waitress	4.00	Waitress	4.00	Does not want trade work
STEPHEN	Landscape	5.50	Laborer	8.00	Several casual labor jobs
TAMERIUS	Food Service	3.50	Lumber yard clerk	6.50	
TARRO	Sports Attendant	5.50	Laborer	7.50	
TAYLOR	AFS		Electrical Apprentice	15.10	
TERRY	Trainer	9.00	Gofer, Sheetmetal Appren	9.50	
TRACY	Clerk	10.91	HAVC Scholarship/PT Clerk	10.91	
UMSCHIED	Clerical	7.07	Laborer, HE Operator	7.50	HE Operator RT/December; waiting dispatch
VAN	Nurses Aid	6.35	Drop 1/17/90		
VANLOO	Cook	7.00	Framer	8.00	
VEACH	Meter Reader	11.60	Electrical Appren U	8.50	Early Placement 9/29/89
VINSON	Stock Trader		Landscape/Commercial	9.00	
WAGNER	Clerk/Mgr	10.00	Carpenter Appren	6.50	Carpentry U
WALKER	Sales	6.50	Property Mgmt	7.50	Several interviews, TML Contractors 5/25/90
WARD	Maintenance	5.00	Maintenance	7.00	Steamfitter apprenticeship 1/24/90
WATERS	Caretaker	3.15	Aviation Program		Available Fall, 1990
WEATHERSBY	Food Service	7.36	Food Serv./Interviewing	7.36	
WEST	PT Maintenence	5.00	Ironworker Appren	9.40	May switch to Electrical NU
WOODSONG	Librarian	7.52	Electrical Appren	7.92	Electrical U
WRIGHT	Clerk	5.00	Laborer	9.00	
		6.88731		8.47573	

B-FIT, Building Futures in Industry and Trades

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